Fire and Police Pension Fund, San Antonio

Actuarial Valuation and Review

As of January 1, 2020

Segal

2727 Paces Ferry Road SE, Building One Suite 1400
Atlanta, GA 30339-4053
segalco.com
T 678.306.3100

June 22, 2020

Board of Trustees
Fire and Police Pension Fund, San Antonio
11603 W. Coker Loop, Suite 201
San Antonio, Texas 78216-3099

Dear Board Members:

We are pleased to submit this Actuarial Valuation and Review as of January 1, 2020. It summarizes the actuarial data used in the valuation, analyzes the preceding year's experience, and establishes the funding requirements for fiscal 2020.

This report was prepared in accordance with generally accepted actuarial principles and practices at the request of the Board to assist in administering the Pension Fund. The census information and financial information on which our calculations were based was prepared by the staff of the Fund. That assistance is gratefully acknowledged.

The actuarial calculations were directed under the supervision of Deborah K. Brigham, FCA, ASA, MAAA, Enrolled Actuary. Ms. Brigham is a member of the American Academy of Actuaries and meets the Qualification Standards of the American Academy of Actuaries to render the actuarial opinion herein. To the best of our knowledge, the information supplied in this actuarial valuation is complete and accurate. Further, in our opinion, the assumptions as approved by the Board are reasonably related to the experience of and the expectations for the Fund.

We look forward to reviewing this report at your next meeting and to answering any questions.

Sincerely,
Segal

Leon F. (Rocky) Joyner, Jr., FCA, ASA, MAAA, EA
Senior Vice President and National Public Sector Retirement Practice Leader

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

Table of Contents

Actuarial Valuation Summary

Purpose and basis

This report was prepared by Segal to present a valuation of the San Antonio Fire and Police Pension Fund as of January 1, 2020. The valuation was performed to determine whether the assets and contributions/contribution rates are sufficient to provide the prescribed benefits. The measurements shown in this actuarial valuation may not be applicable for other purposes. In particular, the measures herein are not necessarily appropriate for assessing the sufficiency of Fund assets to cover the estimated cost of settling the Fund's benefit obligations. 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 economic or demographic assumptions; changes in economic or demographic assumptions; increases or decreases expected as part of the natural operation of the methodology used for these measurements; and changes in plan provisions or applicable law.

The contribution requirements presented in this report are based on:

- The benefit provisions of the Pension Fund, as administered by the Board;
- The characteristics of covered active participants, inactive vested participants, and retired participants and beneficiaries as of December 31, 2019, provided by the Fund;
- The assets of the Plan as of December 31, 2019, provided by the Fund;
- Economic assumptions regarding future salary increases and investment earnings;
- Other actuarial assumptions regarding employee terminations, retirement, death, etc. and
- The funding policy adopted by the Board.

The assumptions and methods used to value the Plan were set by the Board of Trustees, based on recommendations made by Segal following a 4.25-year experience study for the period ended December 31, 2018.

Certain disclosure information required by GASB Statements No. 67 for the Pension Fund's financial statements as of December 31, 2019 and by GASB Statement No. 68 for the City's financial statements as of September 30, 2020 is provided in a separate report.

Valuation highlights

This actuarial valuation is based on plan assets as of December 31, 2019. Due to the COVID-19 pandemic, market conditions have changed significantly since the valuation date. The Fund's actuarial status does not reflect short-term fluctuations of the market, but rather is based on the market values on the last day of the Plan Year. While it is impossible to determine how the market will perform over the next several months, and how that will affect the results of next year's valuation, Segal is available to prepare projections of potential outcomes upon request.

1. The Board's Actuarial Funding Policy for the Pension Fund was updated in March 2020. The policy sets a goal of attaining 100% funding by December 31, 2044, or 25 years from this valuation date. Segal strongly recommends an actuarial funding method that targets 100% funding of the actuarial accrued liability, and the policy adopted by the Fund meets this standard. The Board Recommended Contribution (BRC) under the funding policy is comprised of the normal cost plus an amortization of the unfunded actuarial accrued liability on a level percentage of payroll method. The amortization of the unfunded liability for the recommended contribution in this report is based on 20 years, less than the 25-year target.
2. The recommended contribution rate for the upcoming year is 33.76% of projected payroll, a decrease of 0.27% of pay from the last valuation's recommended rate of 34.03%. As a dollar amount, the recommended contribution has increased from $114.0 million to $115.3 million. An annual increase in recommended dollar amount is expected, since the amortization method targets a rate that will remain level as a percentage of payroll, and payroll is assumed to grow.
3. The City is expected to continue to contribute 24.64% of pay, and members are expected to contribute 12.32%, for a total of 36.96% of pay. The total normal cost is 23.25% of payroll and is fully covered by the 36.96% contribution rate. Since the actual budgeted contributions are greater than the recommended amount, the unfunded liability is effectively being amortized over a period of 13.69 years as a level percent of pay. This is a 0.20-year decrease in the effective period from 13.89 in the prior valuation. If all assumptions are met in the future, 100% funding is projected in the 2033 Plan Year, well before 2044, and therefore the Fund is in compliance with the provisions of the Board's funding policy. The Fund also continues to meet the requirements of the State Pension Review Board (PRB) for actuarial soundness, and no Funding Soundness Restoration Plan is required.
4. Included in this valuation for the first time are a variety of assumption changes as recommended in the October 1, 2014 – December 31, 2018 experience study for the Fund. The study was presented to the Board in December 2019. Changes were made to the salary scale, payroll growth rate, mortality table, retirement rates, BackDROP utilization, turnover rates, disability rates and other demographic assumptions. In addition to the experience study updates, the administrative expense assumption was increased from $3,200,000 to $3,400,000 in this valuation. Details of the new assumptions are summarized in Section 4, Exhibit I. Overall, the assumption changes decreased the normal cost by $5.2 million, increased the unfunded actuarial accrued liability (UAAL) by $20.4 million and decreased the recommended contribution by approximately $2.4 million, or 0.44% of projected payroll.

Section 1: Actuarial Valuation Summary

5. The funded ratio (the ratio of the actuarial value of assets to actuarial accrued liability) is 87.64%, compared to the prior year funded ratio of 87.94%. This ratio is one measure of funding status, and its history is a measure of funding progress. Using the market value of assets, the funded ratio is 86.99%, compared to 80.42% as of the prior valuation date. These measurements are not necessarily appropriate for assessing the sufficiency of Fund assets to cover the estimated cost of settling the Fund's benefit obligation or the need for or the amount of future contributions.
6. The rate of return on the market value of assets was 15.03% for the 2019 plan year. The return on the actuarial value of assets was 5.89% for the same period, due to the partial recognition of the prior year's investment loss under the asset smoothing method. Since 5.89% is less than the assumed rate of 7.25%, there was an actuarial investment loss this year.
7. The total actuarial experience loss for 2019 is $12.3 million, or 0.3% of actuarial accrued liability. The actuarial investment loss amounted to $44.0 million, but this was partially offset by gains due to demographic experience and actual contributions greater than the recommended amount.
8. This report constitutes an actuarial valuation for the purpose of determining the actuarially determined contribution under the Plan's funding policy and measuring the progress of that funding policy. The Net Pension Liability (NPL) and Pension Expense under Governmental Accounting Standards Board (GASB) Statements No. 67 and No. 68, for inclusion in the Fund's financial statements as of December 31, 2019 and the City's financial statements as of September 30, 2020, will be provided separately.
9. Since the actuarial valuation results are dependent on a given set of assumptions, there is a risk that emerging results may differ significantly as actual experience proves to be different from the assumptions. Segal has not been engaged to perform a detailed analysis of the potential range of the impact of risk relative to the Fund's future financial condition, but a brief discussion of some risks that may affect the Fund is included in Section 2. It is our understanding that the Board hired NEPC to complete an asset-liability study earlier this year that provided insight into some of the potential risks.
10. The City of San Antonio and the San Antonio Professional Firefighters Association came to terms on a new collective bargaining agreement in February 2020. Since that agreement was reached after the valuation date of this report, the impact is not reflected in these results. The previous contract had expired in 2014, and firefighter pay rates had not increased since that time; this contributed to some experience gains for the Fund in recent years. The new agreement provides wage increases as well as lump sums to firefighters over the next five years. It does not provide for retroactive pay, and therefore we do not anticipate an experience loss resulting from a significant jump in salaries next year. The 5% lump sum payable to the firefighters in 2020 will affect the liabilities, however, and we will evaluate the impact as part of the 2021 valuation process.

Summary of key valuation results

		2020	2019
Contributions for plan year beginning January 1:	• Recommended contribution	$115,252,139	$114,008,928
	• Recommended contribution as a percent of payroll	33.76%	34.03%
	• Actual contributions	--	$121,523,943
	• Actual contribution rate	36.96%	36.96%
	• Effective amortization period	13.69 years	13.89 years
Actuarial accrued liability for plan year beginning January 1:	• Retired participants and beneficiaries	$2,120,961,569	$2,000,711,128
	• Inactive vested participants[1]	1,712,775	575,115
	• Active participants	1,793,719,675	1,746,585,796
	• Inactive participants due a refund of employee contributions	2,129,777	1,378,821
	• Total	3,918,523,796	3,749,250,860
	• Normal cost including administrative expenses and adjusted for timing	79,380,993	81,832,563
Assets for plan year beginning January 1:	• Market value of assets (MVA)	$3,408,690,035	$3,015,158,660
	• Actuarial value of assets (AVA)	3,434,094,746	3,297,010,974
	• Actuarial value of assets as a percentage of market value of assets	100.75%	109.35%
Funded status for plan year beginning January 1:	• Unfunded actuarial accrued liability on market value of assets	$509,833,761	$734,092,200
	• Funded percentage on MVA basis	86.99%	80.42%
	• Unfunded actuarial accrued liability on actuarial value of assets	$484,429,050	$452,239,886
	• Funded percentage on AVA basis	87.64%	87.94%
Key assumptions	• Net investment return	7.25%	7.25%
	• Inflation rate	3.00%	3.00%
	• Payroll increase	3.00%	3.50%
Demographic data for plan year beginning January 1:	• Number of retired participants and beneficiaries	2,858	2,779
	• Number of inactive vested participants	2	1
	• Number of active participants	4,081	4,042
	• Number of inactive participants due a refund of employee contributions	35	19
	• Total payroll	$321,760,368	$320,420,347
	• Average payroll	78,844	79,273
	• Projected payroll	$341,384,778	$335,065,889

[1]Participants with 20 or more years of service who are on indefinite suspension are included as inactive vested participants entitled to retirement benefits, rather than inactive participants due a refund on contributions.

Important information about actuarial valuations

An actuarial valuation is a budgeting tool with respect to the financing of future projected obligations of a pension plan. It is an estimated forecast – the actual long-term cost of the plan will be determined by the actual benefits and expenses paid and the actual investment experience of the plan.

In order to prepare a valuation, Segal relies on a number of input items. These include:

Plan of benefits	Plan provisions define the rules that will be used to determine benefit payments, and those rules, or the interpretation of them, may change over time. Even where they appear precise, outside factors may change how they operate. It is important to keep Segal informed with respect to plan provisions and administrative procedures, and to review the plan summary included in our report to confirm that Segal has correctly interpreted the plan of benefits.
Participant data	An actuarial valuation for a plan is based on data provided to the actuary by the Fund. Segal does not audit such data for completeness or accuracy, other than reviewing it for obvious inconsistencies compared to prior data and other information that appears unreasonable. It is important for Segal to receive the best possible data and to be informed about any known incomplete or inaccurate data.
Assets	The valuation is based on the market value of assets as of the valuation date, as provided by the Fund. The Fund uses an “actuarial value of assets” that differs from market value to gradually reflect year-to-year changes in the market value of assets in determining the contribution requirements.
Actuarial assumptions	In preparing an actuarial valuation, Segal projects the benefits to be paid to existing plan participants for the rest of their lives and the lives of their beneficiaries. This projection requires actuarial assumptions as to the probability of death, disability, withdrawal, and retirement of each participant for each year. In addition, the benefits projected to be paid for each of those events in each future year reflect actuarial assumptions as to salary increases and cost-of-living adjustments. The projected benefits are then discounted to a present value, based on the assumed rate of return that is expected to be achieved on the plan’s assets. There is a reasonable range for each assumption used in the projection and the results may vary materially based on which assumptions are selected. It is important for any user of an actuarial valuation to understand this concept. Actuarial assumptions are periodically reviewed to ensure that future valuations reflect emerging plan experience. While future changes in actuarial assumptions may have a significant impact on the reported results that does not mean that the previous assumptions were unreasonable.

Section 1: Actuarial Valuation Summary

The user of Segal's actuarial valuation (or other actuarial calculations) should keep the following in mind:

The actuarial valuation is prepared at the request of the Board. Segal is not responsible for the use or misuse of its report, particularly by any other party.
An actuarial valuation is a measurement of the plan's assets and liabilities at a specific date. Accordingly, except where otherwise noted, Segal did not perform an analysis of the potential range of future financial measures. The actual long-term cost of the plan will be determined by the actual benefits and expenses paid and the actual investment experience of the plan.
Actuarial results in this report are not rounded, but that does not imply precision.
If the Fund is aware of any event or trend that was not considered in this valuation that may materially change the results of the valuation, Segal should be advised, so that we can evaluate it.
Segal does not provide investment, legal, accounting, or tax advice. Segal's valuation is based on our understanding of applicable guidance in these areas and of the plan's provisions, but they may be subject to alternative interpretations. The Board should look to their other advisors for expertise in these areas.

As Segal has no discretionary authority with respect to the management or assets of the Fund, it is not a fiduciary in its capacity as actuaries and consultants with respect to the Fund.

Actuarial Valuation Results

Participant data

The Actuarial Valuation and Review considers the number and demographic characteristics of covered participants, including active participants, inactive vested participants, retired participants and beneficiaries.

This section presents a summary of significant statistical data on these participant groups.

More detailed information for this valuation year and the preceding valuation can be found in *Section 3, Exhibits A, B,* and *C*.

Participant Population: 2010 – 2019

Year Ended December 31[1]	Active Participants	Inactive Vested Participants[2]	Retired Participants and Beneficiaries	Total Non-Actives	Ratio of Non-Actives to Actives
2010	3,808	- -	2,150	2,150	0.56
2011	3,904	- -	2,182	2,182	0.56
2012	3,925	- -	2,255	2,255	0.57
2013	3,955	- -	2,317	2,317	0.59
2014	3,944	- -	2,373	2,373	0.60
2015	3,815	- -	2,478	2,478	0.65
2016	3,787	- -	2,634	2,634	0.70
2017	3,906	3	2,719	2,722	0.70
2018	4,042	1	2,779	2,780	0.69
2019	4,081	2	2,858	2,860	0.70

[1]Prior to 2016, valuation cycles reflect 12-month periods ending September 30.

[2]The chart excludes terminated participants due a refund of employee contributions. Beginning with the 2018 valuation, participants with 20 or more years of service who are on indefinite suspension are included as inactive vested participants entitled to retirement benefits.

Active participants

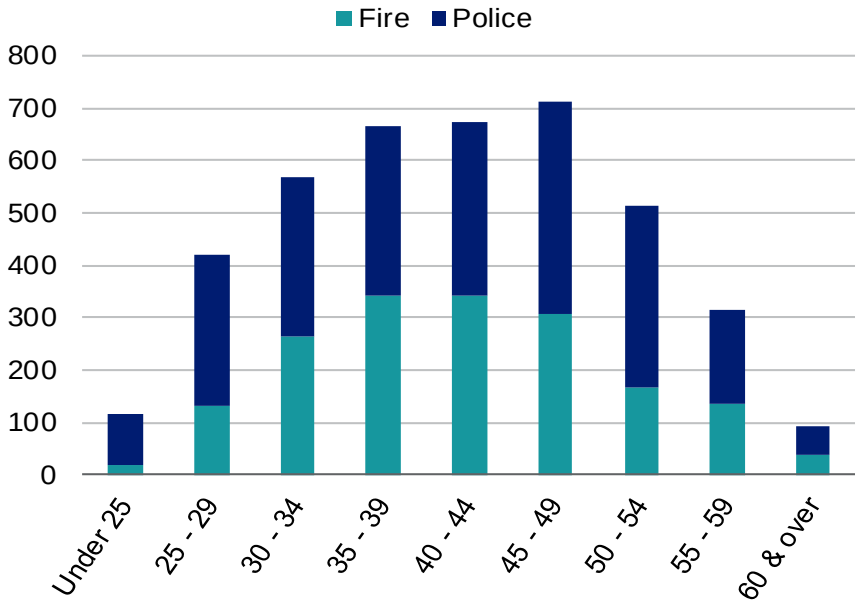
Plan costs are affected by the age, years of service and payroll of active participants. In this year's valuation, there were 4,081 active participants with an average age of 41.9, average years of service of 14.2 years and average payroll of $78,844. The 4,042 active participants in the prior valuation had an average age of 41.9, average service of 14.3 years and average payroll of $79,273.

The number of active Firefighters decreased from 1,778 to 1,750 as of December 31, 2019. Their average age in this valuation is 42.1, their average years of service is 14.6, and their average salary is $76,792. In the last valuation, these averages were 41.6, 14.1, and $76,785, respectively.

The number of active Police Officers increased from 2,264 to 2,331 as of December 31, 2019. The average age of this group decreased from 42.3 to 41.8, the average service decreased from 14.4 to 14.0, and the average salary decreased from $81,227 to $80,384.

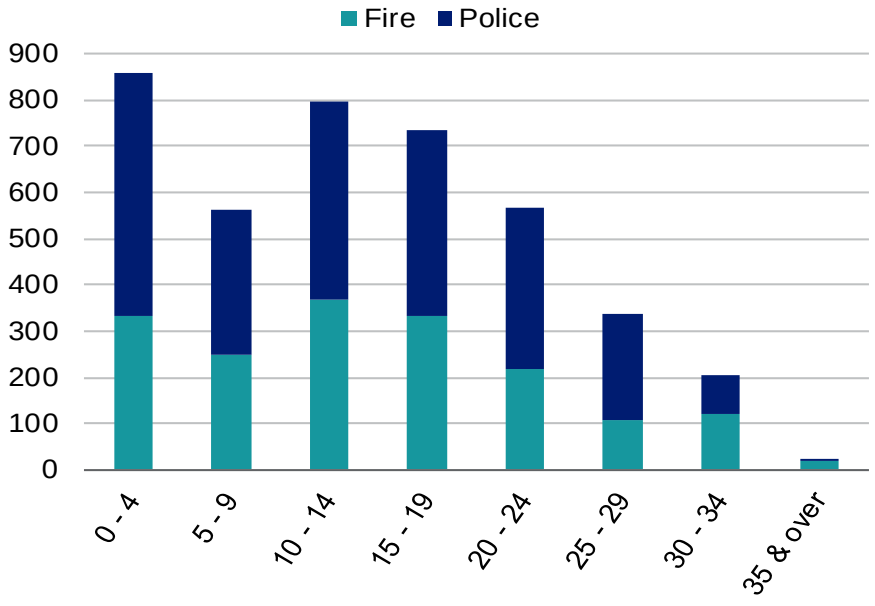
Distribution of Active Participants as of December 31, 2019

Actives by Age



Average age	41.9
Prior year average age	41.9
Difference	0.0

Actives by Years of Service



Average years of service	14.2
Prior year average years of service	14.3
Difference	-0.1

Inactive participants

In this year's valuation, there were 2 participants with a vested right to a deferred or immediate vested benefit. In addition, there were 35 participants entitled to a return of their employee contributions.

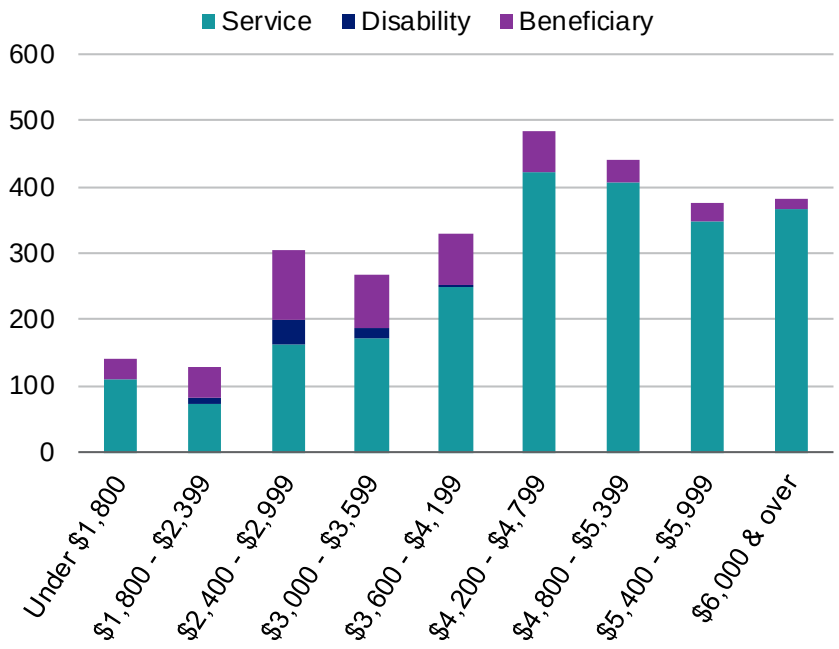
Retired participants and beneficiaries

As of December 31, 2019, 2,377 retired participants and 481 beneficiaries were receiving total monthly benefits of $12,607,264. For comparison, in the previous valuation, there were 2,296 retired participants and 483 beneficiaries receiving monthly benefits of $11,896,666. The 2019 retiree count includes 136 former spouses receiving benefits and the beneficiary count includes 31 dependent children receiving benefits. In the prior valuation there were 127 former spouses and 35 dependent children receiving benefits.

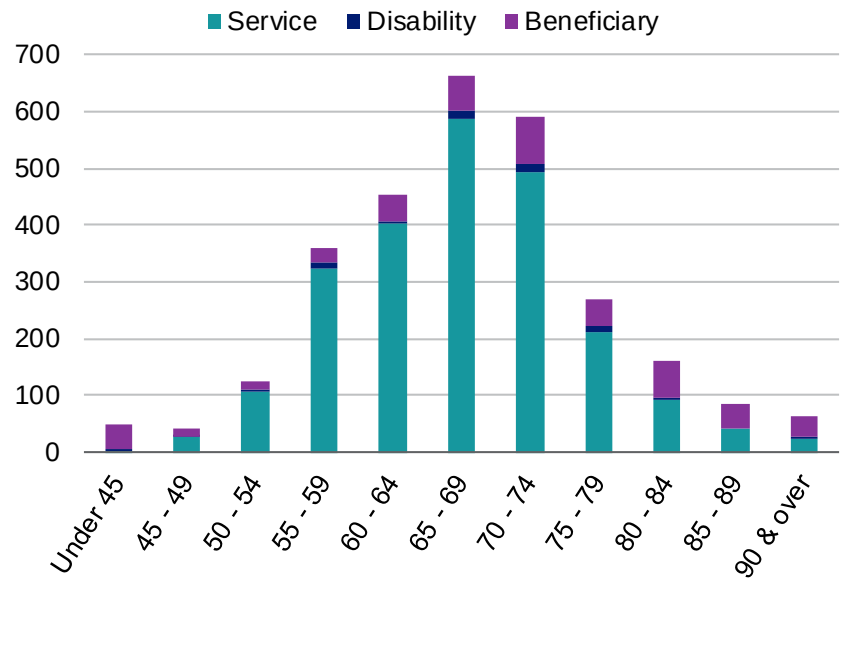
As of December 31, 2019, the average monthly benefit for retired participants and beneficiaries is $4,411, compared to $4,281 in the previous valuation. The average age for retired participants and beneficiaries is 68.3 in the current valuation, compared with 68.1 in the prior valuation.

Distribution of Pensioners and Beneficiaries as of December 31, 2019

Pensioners and Beneficiaries by Type and Monthly Amount



Pensioners and Beneficiaries by Type and Age



Historical plan population

The chart below demonstrates the progression of the active population over the last ten years. The chart also shows the growth among the retired population over the same time period.

Participant Data Statistics: 2010 – 2019

	Active Participants			Retired Participants and Beneficiaries		
Year Ended December 31[1]	Count	Average Age	Average Service	Count	Average Age	Average Monthly Amount
2010	3,808	40.7	13.4	2,150	65.9	$3,491
2011	3,904	40.9	13.4	2,182	66.3	3,573
2012	3,925	41.2	13.6	2,255	66.7	3,712
2013	3,955	41.5	13.9	2,317	67.1	3,796
2014	3,944	41.9	14.3	2,373	67.4	3,879
2015	3,815	42.4	14.8	2,478	67.4	3,951
2016	3,787	42.4	14.8	2,634	67.5	4,049
2017	3,906	42.1	14.5	2,719	67.8	4,160
2018	4,042	41.9	14.3	2,779	68.1	4,281
2019	4,081	41.9	14.2	2,858	68.3	4,411

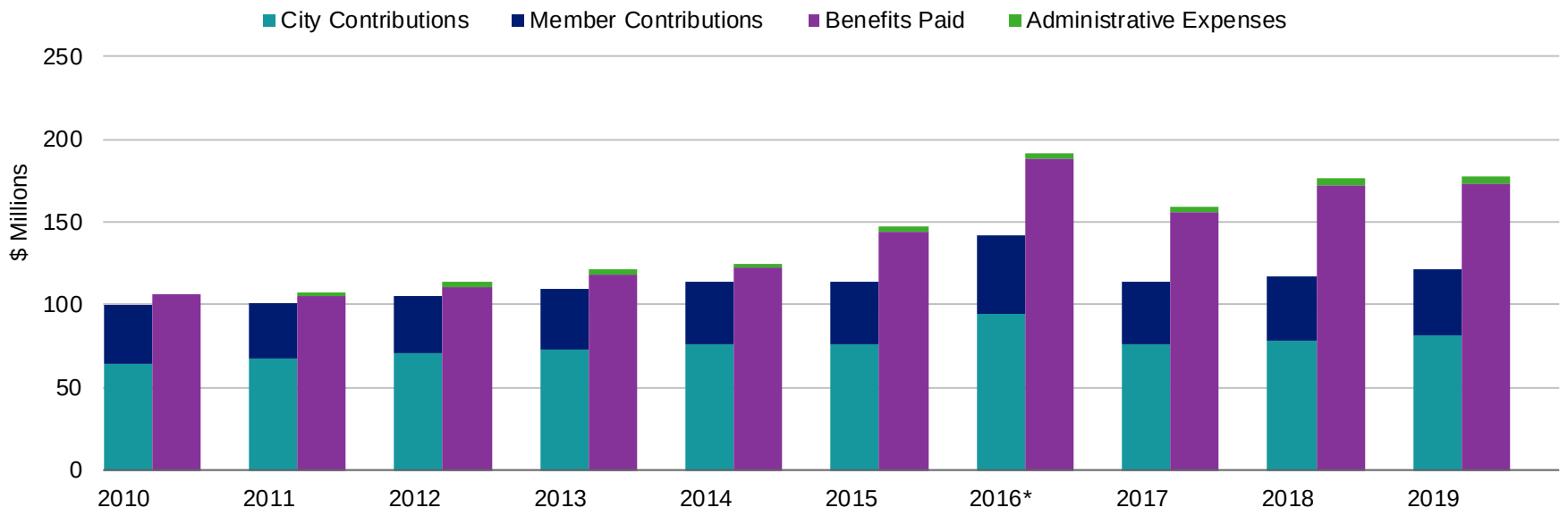
[1]Prior to 2016, the valuation cycle was for the 12-month period ending September 30.

Financial information

Retirement plan funding anticipates that, over the long term, both contributions (less administrative expenses) and investment earnings (less investment fees) will be needed to cover benefit payments. Retirement plan assets change as a result of the net impact of these income and expense components.

Additional financial information, including a summary of transactions for the valuation year, is presented in *Section 3, Exhibits D, E* and *F*.

Comparison of Contributions Made with Benefits and Expenses Paid for Years Ended September 30, 2010 – December 31, 2019



*The cash flows shown for 2016 reflect a 15-month period, due to the change in Plan Year from a September 30 year-end to a December 31, year-end.

Section 2: Actuarial Valuation Results

It is desirable to have level and predictable plan costs from one year to the next. For this reason, the Board has approved an asset valuation method that gradually adjusts to market value. Under this valuation method, the full value of market fluctuations is not recognized in a single year and, as a result, the asset value and the plan costs are more stable. The amount of the adjustment to recognize market value is treated as income, which may be positive or negative. Realized and unrealized gains and losses are treated equally and, therefore, the sale of assets has no immediate effect on the actuarial value.

With the 2018 valuation, the actuarial value of assets was reset to market value, and asset method was revised to reflect a five-year smoothing method with a 20% corridor. Market value gains and losses will be recognized prospectively over a five-year period.

Determination of Actuarial Value of Assets for Year Ended December 31, 2019

1	Market value of assets, December 31, 2019				$3,408,690,035
2	Calculation of unrecognized return	**Original Amount[1]**	**Percent Deferred**	**Unrecognized Amount[2]**	
	(a) Year ended December 31, 2019	$232,480,658	80%	$185,984,526	
	(b) Year ended December 31, 2018	-352,315,393	60%	-211,389,237	
	(c) Year ended December 31, 2017	N/A	40%	N/A	
	(d) Year ended December 31, 2016	N/A	20%	N/A	
	(e) Year ended December 31, 2015	N/A	0%	N/A	
	(f) Total unrecognized return				-25,404,711
3	Preliminary actuarial value: **(1) - (2f)**				$3,434,094,746
4	Adjustment to be within 20% corridor				0
5	Final actuarial value of assets as of December 31, 2019: **(3) + (4)**				3,434,094,746
6	Actuarial value as a percentage of market value: **(5) ÷ (1)**				100.7%
7	Amount deferred for future recognition[3]: **(1) - (5)**				-$25,404,711

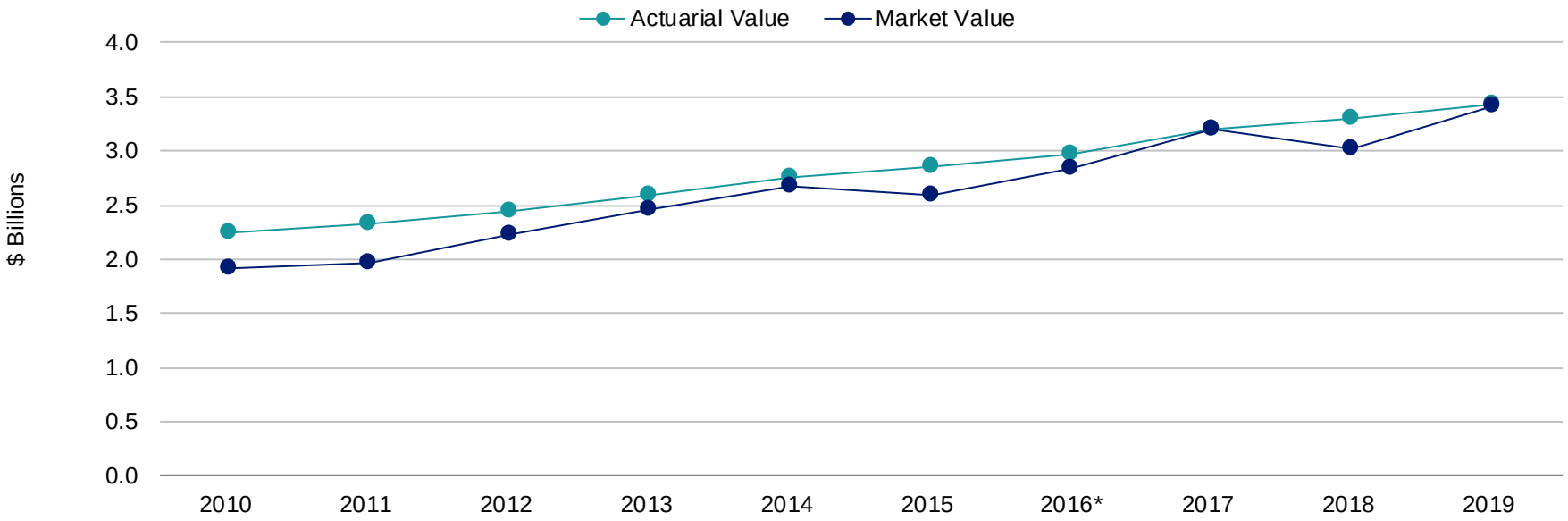
[1]Total return minus expected return on a market value basis
[2]Recognition at 20% per year over five years
[3]Deferred return as of December 31, 2019 recognized in each of the next four years:

(a) Amount recognized on December 31, 2020	-$23,966,947
(b) Amount recognized on December 31, 2021	-23,966,948
(c) Amount recognized on December 31, 2022	-23,966,948
(d) Amount recognized on December 31, 2023	46,496,132

Section 2: Actuarial Valuation Results

Both the actuarial value and market value of assets are representations of the Fund's financial status. As investment gains and losses are gradually taken into account, the actuarial value of assets tracks the market value of assets. The actuarial asset value is significant because the Fund's liabilities are compared to these assets to determine what portion, if any, remains unfunded. Amortization of the unfunded actuarial accrued liability is an important element in determining the contribution requirement.

Actuarial Value of Assets vs. Market Value of Assets as of December 31, 2010 – 2019



*2016 reflects a 15-month period due to the change in Plan Year from a September 30 year-end to a December 31 year-end.

Actuarial experience

To calculate any recommended contribution, assumptions are made about future events that affect the amount and timing of benefits to be paid and assets to be accumulated. Each year actual experience is measured against the assumptions. If overall experience is more favorable than anticipated (an actuarial gain), any contribution requirement will decrease from the previous year. On the other hand, any contribution requirement will increase if overall actuarial experience is less favorable than expected (an actuarial loss).

Taking account of experience gains or losses in one year without making a change in assumptions reflects the belief that the single year's experience was a short-term development and that, over the long term, experience will return to the original assumptions. For contribution requirements to remain stable, assumptions should approximate experience.

If assumptions are changed, the contribution requirement is adjusted to take into account a change in experience anticipated for all future years.

The total loss is $12,347,008, which includes $44,401,238 from investment losses $7,932,008 in contribution gains, and $24,122,222 in-net gains from all other sources. The net experience variation from individual sources other than investments or contributions was 0.6% of the actuarial accrued liability. A discussion of the major components of the actuarial experience is on the following pages.

Actuarial Experience for Year Ended December 31, 2019

1	Net loss from investments[1]	-$44,401,238
2	Net loss from administrative expenses	-375,712
3	Net gain from contributions	7,932,008
4	Net gain from other experience	24,497,934
5	Net experience loss: **1 + 2 + 3 + 4**	-$12,347,008

[1]Details on next page.

Investment experience

A major component of projected asset growth is the assumed rate of return. The assumed return should represent the expected long-term rate of return, based on the Fund's investment policy. The rate of return on the market value of assets was 15.03% for the year ended December 31, 2019.

For valuation purposes, the assumed rate of return on the actuarial value of assets is 7.25%. The actual rate of return on an actuarial basis for the 2019 plan year was 5.89%. Since the actual return for the year was less than the assumed return, the Fund experienced an actuarial loss during the year ended December 31, 2019 with regard to its investments.

Investment Experience

		Year Ended December 31, 2019		Year Ended December 31, 2018	
		Market Value	Actuarial Value	Market Value	Actuarial Value
1	Net investment income	$449,066,512	$192,618,909	-$122,694,031	$159,158,283
2	Average value of assets	2,987,391,092	3,269,243,406	3,167,191,205	3,167,191,205
3	Rate of return: **1 ÷ 2**	15.03%	5.89%	-3.87%	5.03%
4	Assumed rate of return	7.25%	7.25%	7.25%	7.25%
5	Expected investment income: **2 x 4**	216,585,854	237,020,147	229,621,362	229,621,362
6	Actuarial gain/(loss): **1 - 5**	$232,480,658	-$44,401,238	-$352,315,393	-$70,463,079

Section 2: Actuarial Valuation Results

Because actuarial planning is long term, it is useful to see how the assumed investment rate of return has followed actual experience over time. The chart below shows the rate of return on an actuarial basis compared to the actual market value investment return for the last 20 years, including averages over select time periods.

Investment Return – Actuarial Value vs. Market Value: 2000 - 2019

Year Ended September 30	Actuarial Value Investment Return		Market Value Investment Return		Year Ended December 31[1]	Actuarial Value Investment Return		Market Value Investment Return	
	Amount	Percent	Amount	Percent		Amount	Percent	Amount	Percent
2000	$138,497,891	13.35%	$208,388,392	17.52%	2010	$90,918,393	4.20%	$153,829,000	8.68%
2001	88,556,000	7.44	-159,851,000	-11.32	2011	86,867,409	3.87	54,976,000	2.87
2002	53,114,613	4.13	-119,915,000	-9.51	2012	125,396,164	5.39	266,277,000	13.54
2003	82,016,767	6.10	179,311,000	15.66	2013	152,230,272	6.23	248,187,404	11.17
2004	102,912,368	7.18	158,002,000	11.87	2014	174,857,176	6.77	223,053,939	9.07
2005	130,912,911	8.49	207,914,000	13.90	2015	139,532,809	5.10	-47,586,525	-1.79
2006	147,923,772	8.82	173,218,000	10.15	2016[2]	167,460,723	6.15	287,674,638	10.87
2007	190,171,659	10.41	311,238,000	16.54	2017	224,334,206[3]	7.59	407,279,701	14.48
2008	105,099,890	5.24	-292,269,000	-13.40	2018	159,158,283	5.03	-122,694,031	-3.87
2009	69,854,353	3.33	-100,618,000	-5.36	2019	192,618,909	5.89	449,066,512	15.03
					Most recent five-year average return		5.95%		6.82%
					Most recent ten-year average return		5.69%		7.80%
					Most recent 15-year average return		6.03%		6.58%
					Most recent 20-year average return		6.24%		6.20%

Note: Each year's yield is weighted by the average asset value in that year.

[1]Prior to 2017, financial information is based on 12-month periods ending September 30.

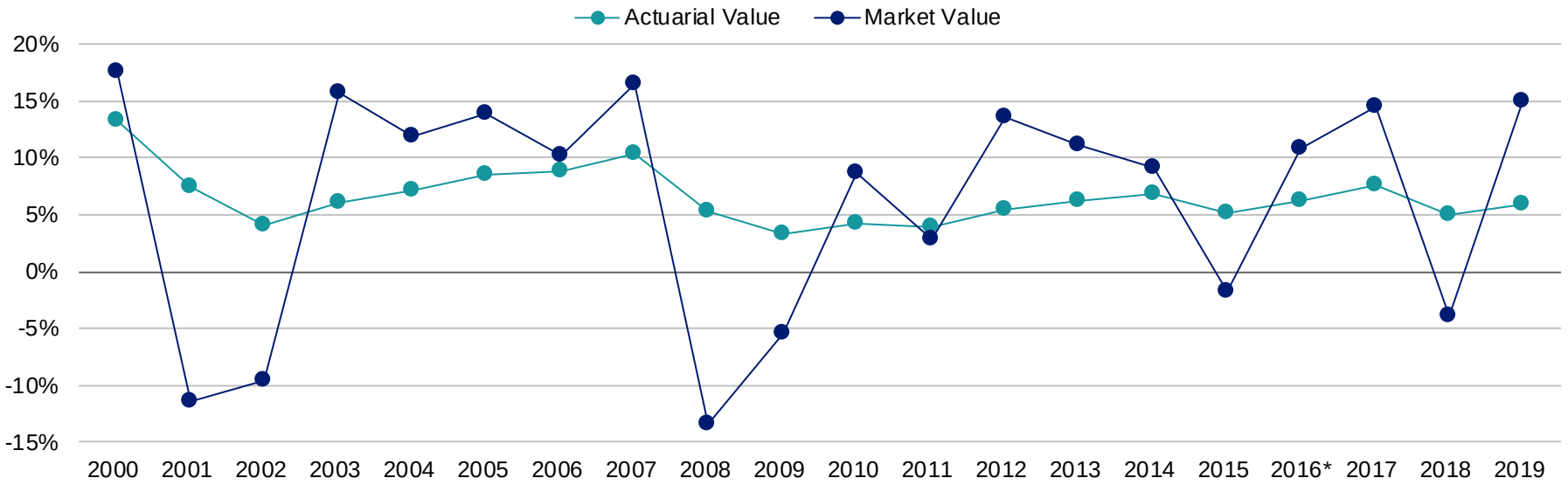
[2]The amounts for the period ended December 31, 2016 cover the 15 months from October 1, 2015 through December 31, 2016. The actuarial and market returns for the year ended December 31, 2016 were 5.99% and 9.26%, respectively.

[3]Excludes change in asset method.

Section 2: Actuarial Valuation Results

As described earlier in this section, the actuarial asset valuation method gradually recognizes fluctuations in the market value rate of return. The goal of this is to stabilize the actuarial rate of return and to produce more level pension plan costs.

Market and Actuarial Rates of Return for Years Ended September 30, 2000 – December 31, 2019



*Reflects a 15-month period due to the change in Plan Year from September 30 year-end to a December 31, year-end.

Contributions

Contributions for the year ended December 31, 2019 totaled $121,523,943, compared to the projected amount of $114,008,928. This resulted in a gain of $7,932,008 for the year, when adjusted for timing.

Non-investment experience

Administrative expenses

- Administrative expenses for the year ended December 31, 2019 totaled $3,564,973, as compared to the assumption of $3,200,000. This resulted in a loss of $375,712 for the year. Based on average expenses in the last three years, we have changed the assumption from $3,200,000 to $3,400,000 for the current year.

Mortality experience

- Mortality experience (more or fewer than expected deaths) yields actuarial gains or losses.
- The average annual number of deaths for nondisabled pensioners in the 4.25-year period of the recent experience review study was 34 per year compared to 34.9 projected deaths per year. However, the average number of deaths for pensioners is too small to be statistically credible.

Other experience

There are other differences between the expected and the actual experience that appear when the new valuation is compared with the projections from the previous valuation. These include:

- the extent of turnover among participants,
- retirement experience (earlier or later than projected),
- the number of disability retirements (more or fewer than projected),
- salary increases (greater or smaller than projected), and
- inflationary cost-of-living adjustments higher or lower than anticipated.

The net gain from this other experience for the year ended December 31, 2019 amounted to $24,497,934, which is 0.6% of the actuarial accrued liability. In part, this gain is attributable to a lower rate of inflation than assumed, which led to lower cost-of-living adjustments than anticipated.

Actuarial assumptions

- A comprehensive experience study was completed in 2019 for the period October 1, 2014 through December 31, 2018. Based on observed and expected future experience, changes were made in the majority of assumptions, including salary scale, payroll growth, mortality, disability, turnover, retirement, BackDROP utilization and other demographic assumptions. All changes are outlined in Section 4, Exhibit I.
- In addition to the recommended changes from the experience study, the administrative expense assumption increased from $3,200,000 to $3,400,000 for the year beginning January 1, 2020.
- These changes increased the actuarial accrued liability by $20.4 million and lowered the normal cost by $5.2 million. The net result was a decrease in the recommended contribution of $2.4 million, or 0.44% of projected payroll.

Details on actuarial assumptions and methods are in Section 4, Exhibit I.

Plan provisions

There were no changes in plan provisions since the prior valuation. A summary of plan provisions is in Section 4, Exhibit II.

Section 2: Actuarial Valuation Results

Development of Unfunded Actuarial Accrued Liability for Year Ended December 31, 2019

1	Unfunded actuarial accrued liability at beginning of year		$452,239,886
2	Normal cost at beginning of year		78,969,904
3	Total contributions		-121,523,943
4	Interest		
	• For whole year on **1 + 2**	$38,512,710	
	• For half year on **3**	-4,405,243	
	Total interest		34,107,467
5	Expected unfunded actuarial accrued liability		$443,793,314
6	Changes due to:		
	• Experience gains and losses	$20,279,016	
	• Assumptions	20,356,720	
	Total changes		$40,635,736
7	Unfunded actuarial accrued liability at end of year		$484,429,050

Recommended contribution

The recommended contribution is equal to the normal cost payment and a 20-year level percentage-of-pay payment on the unfunded actuarial accrued liability. As of January 1, 2020, the recommended contribution is $115,252,139, or 33.76% of payroll.

As set by State legislature, the total amount of annual contributions is comprised of a 12.32% of pay member contribution and a 24.64% of pay City contribution, for a total contribution of 36.96% of pay. Since the actuarially calculated contribution is 33.76% of payroll, there is a margin of 3.20% of projected pay.

The calculated normal cost (including expenses) is 23.25% of projected payroll after adjustment for timing. The remaining 13.71% of projected payroll will amortize the unfunded actuarial accrued liability over a period of 13.69 years if all assumptions are met. This is a reasonable amortization period, and complies with the Texas State Pension Review Board's Guidelines for Actuarial Soundness.

The contribution requirement as of January 1, 2020 is based on the data previously described, the actuarial assumptions and Plan provisions described in *Section 4*, including all changes affecting future costs adopted at the time of the actuarial valuation, actuarial gains and losses, and changes in the actuarial assumptions.

Recommended Contribution for Year Beginning January 1

		2020		2019	
		Amount	% of Projected Payroll	Amount	% of Projected Payroll
1.	Normal cost	$73,321,024		$75,879,955	
2.	Administrative expenses	3,283,071		3,089,949	
3.	Employer normal cost: (1) + (2), adjusted for timing	$79,380,993	23.25%	$81,832,563	24.42%
4.	Actuarial accrued liability	$3,918,523,796		$3,749,250,860	
5.	Actuarial value of assets	3,434,094,746		3,297,010,974	
6.	Unfunded actuarial accrued liability: (4) - (5)	$484,429,050		$452,239,886	
7.	Payment on unfunded actuarial accrued liability, adjusted for timing	35,871,146	10.51%	32,176,365	9.60%
8.	Total recommended contribution: (3) + (7)	$115,252,139	33.76%	$114,008,928	34.03%
9.	Projected payroll	$341,384,778		$335,065,889	

Note: Recommended contributions are assumed to be paid at the middle of every year.

Reconciliation of recommended contribution

The chart below details the changes in the recommended contribution from the prior valuation to the current year's valuation.

Reconciliation of Recommended Contribution from January 1, 2019 to January 1, 2020

	Amount	% of Projected Payroll
Recommended Contribution as of January 1, 2019	$114,008,928	34.03%
• Effect of increase in projected payroll	2,150,318	0.00%
• Effect of contributions more than recommended contribution	-584,771	-0.17%
• Effect of investment loss	3,273,392	0.95%
• Effect of other gains and losses on accrued liability	-1,778,362	-0.52%
• Effect of maintaining 20-year amortization period	-1,194,566	-0.35%
• Effect of changes in actuarial assumptions	-2,595,224	-0.76%
• Effect of change in administrative expense assumption	200,000	0.06%
• Net effect of other changes, including composition and number of participants	1,772,424	0.52%
Total change	$1,243,211	-0.27%
Recommended Contribution as of January 1, 2020	$115,252,139	33.76%

Risk

Since the actuarial valuation results are dependent on a given set of assumptions and data as of a specific date, there is a risk that emerging results may differ significantly as actual experience differs from the assumptions.

This report does not contain a detailed analysis of the potential range of future measurements, but does include a brief discussion of some risks that may affect the Fund. A more detailed assessment of the risks would provide the Trustees with a better understanding of the risks inherent in the Plan. This assessment may include scenario testing, sensitivity testing, stress testing and stochastic modeling. We understand that the Board recently hired NEPC to complete an asset-liability study to assess the investment risks facing the Fund.

- Investment Risk (the risk that returns will be different than expected)

  If the actual return on market value for the next Plan Year were 1% different from the assumed (either higher or lower), the projected unfunded actuarial liability would change by 19%, or about $6.8 million.

  Since the Plan's assets are much larger than contributions, investment performance may create volatility in contribution requirements. For example, for each 1% difference in return from the assumed return, the recommended contribution would increase or decrease by $650,000 (0.18% of payroll).

  The market value rate of return over the last 20 years has ranged from a low of -13.40% to a high of 17.52%.

- Longevity Risk (the risk that mortality experience will be different than expected)

  The actuarial valuation includes an expectation of future improvement in life expectancy. Emerging plan experience that does not match these expectations will result in either an increase or decrease in the recommended contribution.

- Contribution Risk (the risk that actual contributions will be different from recommended contribution)

  Plan contributions are set by statute. Periodic projections comparing expected statutory contributions with the projected recommended contributions may be developed to determine if the statutory amounts are sufficient to fund the Plan and to ensure the payment of promised benefits.

  If contributions remain at current level and future experience matches the current assumptions, we project the unfunded actuarial accrued liability will be paid off in 13.7 years, in compliance with the Board's amortization policy. Currently, contribution risk for the Fund is negligible.

Section 2: Actuarial Valuation Results

- Demographic Risk (the risk that participant experience will be different than assumed)

  Examples of this risk include:

  – Actual retirements occurring earlier or later than assumed. The value of retirement plan benefits is sensitive to the rate of benefit accruals and any early retirement subsidies that apply.

  – More or less active participant turnover than assumed.

- Actual Experience Over the Last ten years and Implications for the Future

  Past experience can help demonstrate the sensitivity of key results to the Plan's actual experience. Over the past ten years:

  The non-investment gain(loss) for a year has ranged from a loss of $58,340,194 to a gain of $61,366,761.

  The funded percentage on the actuarial value of assets has ranged from a low of 87.6% to a high of 92.9% since 2010.

- Maturity Measures

  As pension plans mature, the cash need to fulfill benefit obligations will increase over time. Therefore, cash flow projections and analysis should be performed to assure that the Plan's asset allocation is aligned to meet emerging pension liabilities.

  Currently the Plan has a non-active to active participant ratio of 0.70. For the prior year benefits paid, including BackDROP payments and administrative expenses, were $55,535,137.5 million more than contributions received. As the Plan matures, more cash will be needed from the investment portfolio to meet benefit payments.

  While it is difficult to quantify the impact of potential experience, for the Pension Fund, each 1% change in the actuarial cost factors would result in a change in the recommended contribution of $3.6 million.

GFOA funded liability by type

The Actuarial Accrued Liability represents the present value of benefits earned, calculated using the plan's actuarial cost method. The Actuarial Value of Assets reflects the financial resources available to liquidate the liability. The portion of the liability covered by assets reflects the extent to which accumulated plan assets are sufficient to pay future benefits, and is shown for liabilities associated with employee contributions, pensioner liabilities, and other liabilities. The Government Finance Officers Association (GFOA) recommends that the funding policy aim to achieve a funded ratio of 100 percent. The Board's funding policy targets 100 percent funding by December 31, 2044.

GFOA Funded Liability by Type as of December 31

	2020	2019
Actuarial accrued liability (AAL)		
• Active member contributions	$467,051,408	$454,806,679
• Retirees and beneficiaries	2,120,961,569	2,000,711,128
• Active and inactive members (employer-financed)	1,330,510,819	1,293,733,053
Total	$3,918,523,796	$3,749,250,860
Actuarial value of assets	$3,434,094,746	$3,297,010,974
Cumulative portion of AAL covered		
• Active member contributions	100.00%	100.00%
• Retirees and beneficiaries	100.00%	100.00%
• Active and inactive members (employer-financed)	63.59%	65.04%

Volatility ratios

Retirement plans are subject to volatility in the level of required contributions. This volatility tends to increase as retirement plans become more mature.

The Asset Volatility Ratio (AVR), which is equal to the market value of assets divided by total payroll, provides an indication of the potential contribution volatility for any given level of investment volatility. A higher AVR indicates that the plan is subject to a greater level of contribution volatility. This is a current measurement since it is based on the current level of assets.

The current AVR is about 10.6. This means that a 1% asset gain or loss (relative to the assumed investment return) translates to about 10.6% of one-year's payroll. Since actuarial gains and losses are amortized over 20 years, there would be a 0.8% of payroll decrease/(increase) in the required contribution for each 1% asset gain or loss. The Liability Volatility Ratio (LVR), which is equal to the Actuarial Accrued Liability divided by payroll, provides an indication of the longer-term potential for contribution volatility for any given level of investment volatility. This is because, over an extended period of time, the plan's assets should track the plan's liabilities. For example, if a plan is 50% funded on a market value basis, the liability volatility ratio would be double the asset volatility ratio and the plan sponsor should expect contribution volatility to increase over time as the plan becomes better funded.

The LVR also indicates how volatile contributions will be in response to changes in the Actuarial Accrued Liability due to actual experience or to changes in actuarial assumptions. The current LVR is about 12.2. This is about **15.1%** higher than the AVR. Therefore, we would expect that contribution volatility will increase over the long term.

Volatility Ratios for Years Ended 2010 - 2019

Year Ended December 31	Asset Volatility Risk	Liability Volatility Risk
2010	7.4	9.5
2011	7.2	9.3
2012	7.9	9.4
2013	8.3	9.5
2014	8.7	9.6
2015	8.6	10.7
2016	9.3	11.1
2017	10.4	11.5
2018	9.4	11.7
2019	10.6	12.2

Supplemental Information

Exhibit A: Table of Plan Coverage

A-1 Total

Category	Year Ended December 31 2019	2018	Change From Prior Year
Active participants in valuation:			
• Number	4,081	4,042	1.0%
• Average age	41.9	41.9	0.0
• Average years of service	14.2	14.3	-0.1
• Total payroll	$321,760,368	$320,420,427	0.4%
• Average payroll	78,844	79,273	-0.5%
• Account balances	467,051,408	454,806,679	2.7%
• Total active vested participants	1,131	1,165	-2.9%
Inactive vested participants[1]	2	1	100.0%
Inactive nonvested participants due a refund	35	19	84.2%
Retired participants:			
• Number in pay status	2,314	2,232	3.7%
• Average age	67.5	67.2	0.3
• Average monthly benefit	$4,660	$4,528	3.1%
Disabled participants:			
• Number in pay status	63	64	-1.6%
• Average age	66.7	66.8	-0.1
• Average monthly benefit	$2,785	$2,735	1.8%
Beneficiaries:			
• Number in pay status	481	483	-0.4%
• Average age	72.7	72.4	0.3
• Average monthly benefit	$3,495	$3,343	4.5%

[1]Terminated participants with 20 or more year of service are included as inactive vested participants.

Exhibit A: Table of Plan Coverage

A-2 Fire

Category	Year Ended December 31 2019	2018	Change From Prior Year
Active participants in valuation:			
• Number	1,750	1,778	-1.6%
• Average age	42.1	41.6	0.5
• Average years of service	14.6	14.1	0.5
• Total payroll	$134,386,224	$136,523,301	-1.6%
• Average payroll	76,792	76,785	0.0%
• Account balances	201,264,473	194,492,769	3.5%
• Total active vested participants	464	460	0.9%
Inactive vested participants[1]	1	0	100.0%
Inactive nonvested participants due a refund	15	9	66.7%
Retired participants:			
• Number in pay status	939	916	2.5%
• Average age	68.3	68.2	0.1
• Average monthly benefit	$4,697	$4,593	2.3%
Disabled participants:			
• Number in pay status	27	28	-3.6%
• Average age	70.4	70.0	0.4
• Average monthly benefit	$2,793	$2,752	1.5%
Beneficiaries:			
• Number in pay status	197	195	1.0%
• Average age	74.5	74.1	0.4
• Average monthly benefit	$3,740	$3,589	4.2%

[1]Terminated participants with 20 or more year of service are included as inactive vested participants.

Exhibit A: Table of Plan Coverage

A-3 Police

Category	Year Ended December 31 2019	2018	Change From Prior Year
Active participants in valuation:			
• Number	2,331	2,264	3.0%
• Average age	41.8	42.3	-0.5
• Average years of service	14.0	14.4	-0.4
• Total payroll	$187,374,144	$183,897,046	1.9%
• Average payroll	80,384	81,227	-1.0%
• Account balances	265,786,935	260,313,909	2.1%
• Total active vested participants	667	705	-5.4%
Inactive vested participants[1]	1	1	0.0%
Inactive nonvested participants due a refund	20	10	100.0%
Retired participants:			
• Number in pay status	1,375	1,316	4.5%
• Average age	66.8	66.5	0.3
• Average monthly benefit	$4,611	$4,483	2.9%
Disabled participants:			
• Number in pay status	36	36	0.0%
• Average age	63.9	64.3	-0.40
• Average monthly benefit	$2,779	$2,722	2.1%
Beneficiaries:			
• Number in pay status	284	288	-1.4%
• Average age	71.4	71.2	0.2
• Average monthly benefit	$3,326	$3,176	4.7%

[1]Terminated participants with 20 or more year of service are included as inactive vested participants.

Exhibit B: Participants in Active Service as of December 31, 2019 by Age, Years of Service, and Average Payroll

B-1 Total

		Years of Service								
Age	**Total**	**0 - 4**	**5 - 9**	**10 - 14**	**15 - 19**	**20 - 24**	**25 - 29**	**30 - 34**	**35 - 39**	**40 & over**
Under 25	118	118	- -	- -	- -	- -	- -	- -	- -	- -
	$40,027	$40,027	- -	- -	- -	- -	- -	- -	- -	- -
25 - 29	420	374	46	- -	- -	- -	- -	- -	- -	- -
	59,856	58,081	$74,288	- -	- -	- -	- -	- -	- -	- -
30 - 34	569	252	235	82	- -	- -	- -	- -	- -	- -
	67,627	57,503	74,648	$78,619	- -	- -	- -	- -	- -	- -
35 - 39	664	90	188	334	52	- -	- -	- -	- -	- -
	75,055	59,941	73,680	78,463	$84,295	- -	- -	- -	- -	- -
40 - 44	674	18	74	246	311	25	- -	- -	- -	- -
	81,224	46,963	72,706	78,320	86,391	$95,411	- -	- -	- -	- -
45 - 49	712	5	12	96	280	265	54	- -	- -	- -
	87,909	54,127	77,835	77,369	85,642	92,722	$100,143	- -	- -	- -
50 - 54	514	- -	8	30	71	194	155	56	- -	- -
	92,805	- -	75,990	78,295	82,843	92,949	98,354	$99,752	- -	- -
55 - 59	316	- -	- -	8	12	68	110	113	5	- -
	94,121	- -	- -	85,497	87,016	88,541	95,135	97,881	$93,593	- -
60 - 64	86	- -	- -	- -	8	14	17	34	11	2
	93,739	- -	- -	- -	81,233	92,068	94,956	94,747	101,146	$87,261
65 & over	8	- -	- -	- -	- -	1	2	2	- -	3
	92,462	- -	- -	- -	- -	87,726	92,721	103,009	- -	86,838
Total	4,081	857	563	796	734	567	338	205	16	5
	$78,844	$55,364	$74,127	$78,367	$85,568	$92,392	$97,388	$97,922	$98,786	$87,007

Exhibit B: Participants in Active Service as of December 31, 2019 by Age, Years of Service, and Average Payroll

B-2 Fire

		Years of Service								
Age	**Total**	**0 - 4**	**5 - 9**	**10 - 14**	**15 - 19**	**20 - 24**	**25 - 29**	**30 - 34**	**35 - 39**	**40 & over**
Under 25	19	19	- -	- -	- -	- -	- -	- -	- -	- -
	$52,281	$52,281	- -	- -	- -	- -	- -	- -	- -	- -
25 - 29	132	122	10	- -	- -	- -	- -	- -	- -	- -
	59,405	58,648	$68,639	- -	- -	- -	- -	- -	- -	- -
30 - 34	265	141	90	34	- -	- -	- -	- -	- -	- -
	64,032	57,843	69,682	$74,748	- -	- -	- -	- -	- -	- -
35 - 39	343	53	111	148	31	- -	- -	- -	- -	- -
	72,129	62,611	70,399	74,768	$81,993	- -	- -	- -	- -	- -
40 - 44	341	- -	38	138	148	17	- -	- -	- -	- -
	79,335	- -	69,600	74,932	83,978	$96,425	- -	- -	- -	- -
45 - 49	308	- -	1	47	132	112	16	- -	- -	- -
	84,973	- -	65,142	73,644	83,778	89,277	$99,234	- -	- -	- -
50 - 54	168	- -	- -	- -	23	67	46	32	- -	- -
	88,568	- -	- -	- -	79,163	86,934	93,797	$91,233	- -	- -
55 - 59	137	- -	- -	- -	- -	21	42	69	5	- -
	90,066	- -	- -	- -	- -	84,750	90,814	90,974	$93,593	- -
60 - 64	34	- -	- -	- -	- -	- -	4	20	8	2
	92,310	- -	- -	- -	- -	- -	91,846	91,593	95,599	$87,261
65 & over	3	- -	- -	- -	- -	- -	- -	- -	- -	3
	86,838	- -	- -	- -	- -	- -	- -	- -	- -	86,838
Total	1,750	335	250	367	334	217	108	121	13	5
	$76,792	$58,575	$69,928	$74,684	$83,383	$88,675	$93,370	$91,144	$94,828	$87,007

Exhibit B: Participants in Active Service as of December 31, 2019 by Age, Years of Service, and Average Payroll

B-3 Police

		Years of Service							
Age	**Total**	**0-4**	**5-9**	**10-14**	**15 - 19**	**20 - 24**	**25 - 29**	**30 - 34**	**35 & over**
Under 25	99	99	- -	- -	- -	- -	- -	- -	- -
	$37,675	$37,675	- -	- -	- -	- -	- -	- -	- -
25 - 29	288	252	36	- -	- -	- -	- -	- -	- -
	60,062	57,806	$75,857	- -	- -	- -	- -	- -	- -
30 - 34	304	111	145	48	- -	- -	- -	- -	- -
	70,760	57,070	77,730	$81,362	- -	- -	- -	- -	- -
35 - 39	321	37	77	186	21	- -	- -	- -	- -
	78,183	56,118	78,410	81,404	$87,693	- -	- -	- -	- -
40 - 44	333	18	36	108	163	8	- -	- -	- -
	83,159	46,963	75,985	82,650	88,582	$93,257	- -	- -	- -
45 - 49	404	5	11	49	148	153	38	- -	- -
	90,146	54,127	78,989	80,942	87,305	95,244	$100,525	- -	- -
50 - 54	346	- -	8	30	48	127	109	24	- -
	94,862	- -	75,990	78,295	84,606	96,123	100,277	$111,112	- -
55 - 59	179	- -	- -	8	12	47	68	44	- -
	97,225	- -	- -	85,497	87,016	90,235	97,804	108,713	- -
60 - 64	52	- -	- -	- -	8	14	13	14	3
	94,674	- -	- -	- -	81,233	92,068	95,914	99,252	$115,938
65 & over	5	- -	- -	- -	- -	1	2	2	- -
	95,837	- -	- -	- -	- -	87,726	92,721	103,009	- -
Total	2,331	522	313	429	400	350	230	84	3
	$80,384	$53,303	$77,481	$81,519	$87,392	$94,696	$99,275	$107,686	$115,938

Exhibit C: Reconciliation of Participant Data

	Active Participants	Inactive Vested Participants	Disableds	Retired Participants	Beneficiaries	Total
Number as of January 1, 2019	**4,042**	**1**	**64**	**2,232**	**483**	**6,822**
• New participants	187	N/A	N/A	N/A	N/A	187
• Terminations – with vested rights	-2	2	0	0	0	0
• Terminations – without vested rights	-18	N/A	N/A	N/A	N/A	-18
• Retirements	-111	0	N/A	111	N/A	0
• New disabilities	-1	0	1	N/A	N/A	0
• Return to work	1	-1	0	0	N/A	0
• Died with beneficiary	-2	0	-2	-40	-27	-71
• Died without beneficiary	0	0	0	0	29	29
• Lump sum cash-outs	-15	0	0	0	0	-15
• Rehire	0	0	N/A	0	N/A	0
• Payment period for dependent children expired	N/A	N/A	0	0	-4	-4
• Data adjustments	0	0	0	0	0	0
• Active participants no longer accruing benefits	0	0	N/A	N/A	N/A	0
• QDRO adjustments[1]	0	0	0	11	0	11
Number as of January 1, 2020	**4,081**	**2**	**63**	**2,314**	**481**	**6,941**

Note: Chart excludes terminated participants due a refund of employee contributions.

[1]The data includes 11 new former spouses receiving benefit under qualified domestic relations orders (QDROs), and excludes two former spouses whose benefit terminated during the year.

Exhibit D: Summary Statement of Income and Expenses on a Market Value Basis

	Year Ended December 31, 2019		Year Ended December 31, 2018	
Net assets at market value at the beginning of the year		$3,015,158,660		$3,196,529,718
Contribution income:				
• City contributions	$81,016,332		$78,312,472	
• Member contributions	40,507,611		39,182,276	
• Less administrative expenses	-3,564,973		-3,479,408	
Net contribution income		*$117,958,970*		*$114,015,340*
Investment income:				
• Interest, dividends and other income	$69,548,748		$60,942,510	
• Asset appreciation	395,739,670		-168,171,996	
• Less investment fees	-16,221,906		-15,464,545	
Net investment income		*$449,066,512*		*-$122,694,031*
Total income available for benefits		**$567,025,482**		**-$8,678,691**
Less benefit payments:				
• Benefits	-$148,724,828		-$152,400,479	
• BackDROP payments	-23,596,830		-19,373,514	
• Refunds	-1,172,449		-918,374	
Net benefit payments		*-$173,494,107*		*-$172,692,367*
Change in market value of assets		**$393,531,375**		**-$181,371,058**
Net assets at market value at the end of the year		**$3,408,690,035**		**$3,015,158,660**

Exhibit E: Summary Statement of Plan Assets

	December 31, 2019	December 31, 2018
Cash equivalents	$91,443,273	$57,717,618
Total accounts receivable	$35,413,239	$17,071,460
Investments:		
• Equities	$1,889,424,491	$1,766,873,231
• Fixed income	1,033,934,624	801,735,469
• Real estate and real assets	378,994,861	386,278,955
• Property, plant and equipment[1]	748,274	515,913
Total investments at market value	$3,303,102,250	$2,955,403,568
Total assets	$3,429,958,762	$3,030,192,646
Total accounts payable	-21,268,727	-15,033,986
Net assets at market value	**$3,408,690,035**	**$3,015,158,660**
Net assets at actuarial value	**$3,434,094,746**	**$3,297,010,974**

[1]Represents less than 0.1% of the total investments

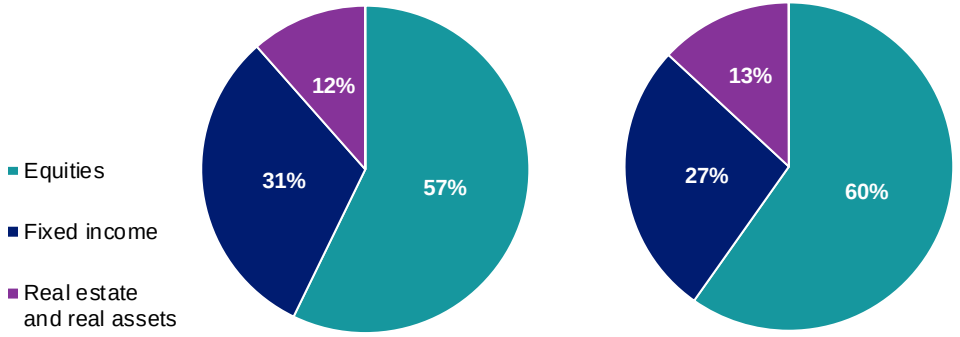


Exhibit F: Development of the Fund through December 31, 2019

Year Ended December 31[1]	City Contributions	Member Contributions	Net Investment Return[2]	Admin. Expenses	Benefit Payments	Market Value of Assets at Year-End	Actuarial Value of Assets at Year-End	Actuarial Value as a Percent of Market Value
2010	$64,498,000	$34,849,000	$153,829,000	$0	$106,640,000	$1,921,974,000	$2,250,549,152	117.1%
2011	67,328,000	33,663,000	54,976,000	2,728,000	105,159,000	1,970,054,000	2,330,520,561	118.3%
2012	70,389,000	35,193,000	266,277,000	2,747,000	111,164,000	2,228,002,000	2,447,587,725	109.9%
2013	73,255,620	36,629,009	248,187,404	2,714,633	118,680,884	2,464,678,516	2,588,307,109	105.0%
2014	76,145,635	38,072,618	223,053,939	2,789,578	122,305,997	2,676,855,133	2,752,286,963	102.8%
2015	75,801,715	37,901,064	-47,586,525	2,903,392	144,157,312	2,595,910,683	2,858,461,847	110.1%
2016[3]	94,972,075	47,485,016	287,674,638	3,568,003	187,925,984	2,834,548,425	2,976,885,674	105.0%
2017	75,915,522	37,958,082	407,279,701	3,034,563	156,137,449	3,196,529,718	3,196,529,718	100.0%
2018	78,312,472	39,182,276	-122,694,031	3,479,408	172,692,367	3,015,158,660	3,297,010,974	109.3%
2019	81,016,332	40,507,611	449,066,512	3,564,973	173,494,107	3,408,690,035	3,434,094,746	100.7%

[1]Prior to 2016, financial information was based on 12-month periods ending September 30.
[2]On a market basis, net of investment fees.
[3]Reflects the 15-month period from October 1, 2015 through December 31, 2016.

Exhibit G: Definition of Pension Terms

The following list defines certain technical terms for the convenience of the reader:

Actuarial Accrued Liability for Actives:	The equivalent of the accumulated normal costs allocated to the years before the valuation date.
Actuarial Accrued Liability for Pensioners and Beneficiaries:	The single-sum value of lifetime benefits to existing pensioners and beneficiaries. This sum takes account of life expectancies appropriate to the ages of the annuitants and the interest that the sum is expected to earn before it is entirely paid out in benefits.
Actuarial Cost Method:	A procedure allocating the Actuarial Present Value of Future Benefits to various time periods; a method used to determine the Normal Cost and the Actuarial Accrued Liability that are used to determine the recommended contribution.
Actuarial Gain or Loss:	A measure of the difference between actual experience and that expected based upon a set of Actuarial Assumptions, during the period between two Actuarial Valuation dates. Through the actuarial assumptions, rates of decrements, rates of salary increases, and rates of fund earnings have been forecasted. To the extent that actual experience differs from that assumed, Actuarial Accrued Liabilities emerge which may be the same as forecasted, or may be larger or smaller than projected. Actuarial gains are due to favorable experience, e.g., assets earn more than projected, salary increases are less than assumed, members retire later than assumed, etc. Favorable experience means actual results produce actuarial liabilities not as large as projected by the actuarial assumptions. On the other hand, actuarial losses are the result of unfavorable experience, i.e., actual results yield in actuarial liabilities that are larger than projected. Actuarial gains will shorten the time required for funding of the actuarial balance sheet deficiency while actuarial losses will lengthen the funding period.
Actuarially Equivalent:	Of equal actuarial present value, determined as of a given date and based on a given set of Actuarial Assumptions.
Actuarial Present Value (APV):	The value of an amount or series of amounts payable or receivable at various times, determined as of a given date by the application of a particular set of Actuarial Assumptions. Each such amount or series of amounts is: Adjusted for the probable financial effect of certain intervening events (such as changes in compensation levels, marital status, etc.) Multiplied by the probability of the occurrence of an event (such as survival, death, disability, withdrawal, etc.) on which the payment is conditioned, and Discounted according to an assumed rate (or rates) of return to reflect the time value of money.

Section 3: Supplemental Information

Actuarial Present Value of Future Plan Benefits:	The Actuarial Present Value of benefit amounts expected to be paid at various future times under a particular set of Actuarial Assumptions, taking into account such items as the effect of advancement in age, anticipated future compensation, and future service credits. The Actuarial Present Value of Future Plan Benefits includes the liabilities for active members, retired members, beneficiaries receiving benefits, and inactive members entitled to either a refund or a future retirement benefit. Expressed another way, it is the value that would have to be invested on the valuation date so that the amount invested plus investment earnings would provide sufficient assets to pay all projected benefits and expenses when due.
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 plan. An Actuarial Valuation for a governmental retirement system typically also includes calculations of items needed for compliance with GASB, such as the Actuarially Determined Contribution (ADC) and the Net Pension Liability (NPL).
Actuarial Value of Assets (AVA):	The value of the Fund's assets as of a given date, used by the actuary for valuation purposes. This may be the market or fair value of plan assets, but commonly plans use a smoothed value in order to reduce the year-to-year volatility of calculated results, such as the funded ratio and the ADC.
Actuarially Determined:	Values that have been determined utilizing the principles of actuarial science. An actuarially determined value is derived by application of the appropriate actuarial assumptions to specified values determined by provisions of the law.
Actuarially Determined Contribution (ADC):	The employer's periodic required contributions, expressed as a dollar amount or a percentage of covered plan compensation, determined under the Plan's funding policy. The ADC consists of the Employer Normal Cost and the Amortization Payment.
Amortization Method:	A method for determining the Amortization Payment. The most common methods used are level dollar and level percentage of payroll. Under the Level Dollar method, the Amortization Payment is one of a stream of payments, all equal, whose Actuarial Present Value is equal to the UAAL. Under the Level Percentage of Pay method, the Amortization Payment is one of a stream of increasing payments, whose Actuarial Present Value is equal to the UAAL. Under the Level Percentage of Pay method, the stream of payments increases at the assumed rate at which total covered payroll of all active members will increase.
Amortization Payment:	The portion of the pension plan contribution, or ADC, that is designed to pay interest on and to amortize the Unfunded Actuarial Accrued Liability.

Section 3: Supplemental Information

Assumptions or Actuarial Assumptions:	The estimates upon which the cost of the Fund is calculated, including: Investment return - the rate of investment yield that the Fund will earn over the long-term future; Mortality rates - the death rates of employees and pensioners; life expectancy is based on these rates; Retirement rates - the rate or probability of retirement at a given age or service; Disability rates – the probability of disability retirement at a given age; Withdrawal rates - the rates at which employees of various ages are expected to leave employment for reasons other than death, disability, or retirement; Salary increase rates - the rates of salary increase due to inflation and productivity growth.
Closed Amortization Period:	A specific number of years that is counted down by one each year, and therefore declines to zero with the passage of time. For example, if the amortization period is initially set at 30 years, it is 29 years at the end of one year, 28 years at the end of two years, etc. See Open Amortization Period.
Decrements:	Those causes/events due to which a member's status (active-inactive-retiree-beneficiary) changes, that is: death, retirement, disability, or withdrawal.
Defined Benefit Plan:	A retirement plan in which benefits are defined by a formula applied to the member's compensation and/or years of service.
Defined Contribution Plan:	A retirement plan, such as a 401(k) plan, a 403(b) plan, or a 457 plan, in which the contributions to the plan are assigned to an account for each member, the plan's earnings are allocated to each account, and each member's benefits are a direct function of the account balance.
Employer Normal Cost:	The portion of the Normal Cost to be paid by the employer. This is equal to the Normal Cost less expected member contributions.
Experience Study:	A periodic review and analysis of the actual experience of the Fund that may lead to a revision of one or more actuarial assumptions. Actual rates of decrement and salary increases are compared to the actuarially assumed values and modified as deemed appropriate by the Actuary.
Funded Ratio:	The ratio of the actuarial value of assets (AVA) to the actuarial accrued liability (AAL). Plans sometimes calculate a market funded ratio, using the market value of assets (MVA), rather than the AVA.

Section 3: Supplemental Information

GASB 67 and GASB 68:	Governmental Accounting Standards Board (GASB) Statements No. 67 and No. 68. These are the governmental accounting standards that set the accounting rules for public retirement systems and the employers that sponsor or contribute to them. Statement No. 68 sets the accounting rules for the employers that sponsor or contribute to public retirement systems, while Statement No. 67 sets the rules for the systems themselves.
Investment Return:	The rate of earnings of the Fund from its investments, including interest, dividends and capital gain and loss adjustments, computed as a percentage of the average value of the fund. For actuarial purposes, the investment return often reflects a smoothing of the capital gains and losses to avoid significant swings in the value of assets from one year to the next.
Net Pension Liability (NPL):	The Net Pension Liability is equal to the Total Pension Liability minus the Plan Fiduciary Net Position.
Normal Cost:	That portion of the Actuarial Present Value of pension plan benefits and expenses allocated to a valuation year by the Actuarial Cost Method. Any payment in respect of an Unfunded Actuarial Accrued Liability is not part of Normal Cost (see Amortization Payment). For pension plan benefits that are provided in part by employee contributions, Normal Cost refers to the total of employee contributions and employer Normal Cost unless otherwise specifically stated.
Open Amortization Period:	An open amortization period is one which is used to determine the Amortization Payment but which does not change over time. If the initial period is set as 30 years, the same 30-year period is used in determining the Amortization Period each year. In theory, if an Open Amortization Period with level percentage of payroll is used to amortize the Unfunded Actuarial Accrued Liability, the UAAL will never decrease, but will become smaller each year, in relation to covered payroll, if the actuarial assumptions are realized.
Plan Fiduciary Net Position:	Market value of assets.
Total Pension Liability (TPL):	The actuarial accrued liability under the entry age normal cost method and based on the blended discount rate as described in GASB 67 and 68.
Unfunded Actuarial Accrued Liability:	The excess of the Actuarial Accrued Liability over the Actuarial Value of Assets. This value may be negative, in which case it may be expressed as a negative Unfunded Actuarial Accrued Liability, also called the Funding Surplus.
Valuation Date or Actuarial Valuation Date:	The date as of which the value of assets is determined and as of which the Actuarial Present Value of Future Plan Benefits is determined. The expected benefits to be paid in the future are discounted to this date.

Actuarial Valuation Basis

Exhibit I: Actuarial Assumptions and Actuarial Cost Method

Rationale for Assumptions:	The assumptions and methods upon which this valuation is based were set by the Board of Trustees, based on recommendations by Segal following a 4.25-year experience study for the period ended December 31, 2018. The information and analysis used in selecting each assumption are shown in that experience study report. Assumptions are generally reviewed and updated on a five-year cycle.
Net Investment Return:	7.25%. The net investment return assumption was chosen by the Pension Fund's Board of Trustees, with input from the actuary. The assumption is a long-term estimate derived from historical data, current and recent market expectations, and professional judgment. As part of the analysis, a building block approach was used that reflects inflation expectations and anticipated risk premiums for each of the portfolio's asset classes as well as the Fund's target asset allocation.
Administrative Expenses:	$3,400,000 payable mid-year for the year beginning January 1, 2020 (equivalent to $3,283,071 payable at the beginning of the year)
Salary Increases:	

Years of Service	Rate (%)
1	14.00%
2	9.00
3	6.00
4	5.00
5	4.00
6	3.75
7	3.50
8	3.25
9 or more	3.00

Includes an underlying 3.00% inflation component

Assumed to occur at the beginning of each year

Payroll Growth:	3.00% (used to amortize the unfunded actuarial accrued liability as a level percentage of payroll)

Section 4: Actuarial Valuation Basis

Cost-of-Living Adjustments:

Retirement before October 1, 1999: 3.00%

Retirement on or after October 1, 1999: 2.25%

Valuation liabilities reflect the actual COLA granted for 2020. The stated assumptions apply to 2021 forward, at the beginning of each year.

Mortality Rates:

Pre-retirement: PUBS-2010 Safety Employee Amount-Weighted Table, generationally projected using Scale SSA2019-2D

Healthy annuitants: PUBS-2010 Safety Healthy Retiree Amount-Weighted Table, generationally projected using Scale SSA2019-2D

Disabled annuitants: PUBS-2010 Safety Disabled Retiree Amount-Weighted Table, generationally projected using Scale SSA2019-2D

Beneficiaries: PUBS-2010 Safety Contingent Survivor Amount-Weighted Table, generationally projected using Scale SSA2019-2D

The tables above, projected to 2020, reasonably reflect the mortality experience of the Fire and Police Pension Fund as of the measurement date. The mortality tables are generationally projected using Scale SSA2019-2D to reflect future mortality improvement.

Duty Death Percentages: 10% of deaths are assumed to be in the line of duty

Annuitant Mortality Rates:

	Rate (%)[1]					
	Healthy		Disabled		Beneficiary	
Age	Male	Female	Male	Female	Male	Female
55	0.31	0.26	0.48	0.46	0.82	0.45
60	0.51	0.45	0.74	0.70	1.01	0.62
65	0.88	0.77	1.19	1.06	1.38	0.90
70	1.57	1.33	1.91	1.61	2.13	1.35
75	2.83	2.30	3.24	2.44	3.38	2.15
80	5.10	3.96	5.60	3.96	5.36	3.57
85	9.14	6.84	9.21	6.84	8.74	6.32
90	15.86	11.82	15.86	11.82	14.42	11.33

[1]*Rates shown do not include generational projection.*

Catastrophic Disability: 0% of disabilities are assumed to be catastrophic

Section 4: Actuarial Valuation Basis

Termination Rates before Retirement:

	Rate (%)						
	Mortality[1]		Disability[2]		Withdrawal[3]		
Age	Male	Female	Fire	Police	Years of Service	Fire	Police
20	0.04	0.02	0.01	0.01	Less than 1	1.00	2.25
25	0.04	0.02	0.01	0.01	1	1.00	2.25
30	0.04	0.03	0.01	0.01	2	0.60	2.25
35	0.05	0.04	0.01	0.01	3	0.50	2.25
40	0.06	0.05	0.02	0.02	4 - 7	0.40	2.25
45	0.08	0.07	0.04	0.04	8	0.40	2.00
50	0.12	0.09	0.00	0.00	9 - 11	0.40	0.50
55	0.18	0.12	0.00	0.00	12 - 20	0.10	0.50
60	0.26	0.17	0.00	0.00	20 or more	0.00	0.00

[1]Rates shown do not include generational projection.
[2]Disability rates cease at 21 years of service
[3]Withdrawal rates cease at first eligibility for retirement

Retirement Rates:

Fire		Police	
Years of Service	Rate (%)	Years of Service	Rate (%)
20 – 25	1.5	20 – 22	2.5
26	2.0	23 – 24	3.0
27 – 28	3.0	25	4.0
29	8.0	26	5.0
30	10.0	27	10.0
31	15.0	28	12.0
32	30.0	29	17.0
33 – 35	45.0	30	27.0
36	35.0	31	30.0
37	55.0	32	50.0
38	30.0	33	60.0
39	25.0	34	50.0
40	35.0	35 – 38	45.0
41	15.0	39	70.0
42	40.0	40	100.0
43	100.0		

Retirement is assumed to occur no later than age 65 if participant has at least 20 years of service.

Section 4: Actuarial Valuation Basis

Retirement Rates for Inactive Vested Participants:	Former participants with rights to deferred benefits are assumed to retire at earliest eligibility.
Description of Weighted Average Retirement Age:	Age 59.3 for Firefighters and 57.2 for Police Officers, determined as follows: The weighted average retirement age for each participant is calculated as the sum of the product of each potential current or future retirement age times the probability of surviving from current age to that age and then retiring at that age, assuming no other decrements. The overall weighted retirement age is the average of the individual retirement ages based on all the active participants included in the January 1, 2020 actuarial valuation.
Percent Married:	Males: 95% Females: 60%
Age of Spouse:	Females three years younger than males
Marriage after Retirement:	The retiree liability includes a 0.20% load and the disability liability includes a 0.40% load to account for unmarried retirees marrying after retirement.
Beneficiary Liability:	The spousal beneficiary liability includes a 2% load to account for future increased spousal benefits when dependent children receiving benefits reach the age of majority and are no longer eligible to receive benefits.
Utilization of BackDROP:	90% of retiring Firefighters and new beneficiaries are assumed to elect a four-year BackDROP. Firefighters who retire prior to 24 years of service are not assumed to utilize the BackDROP provisions of the plan. 75% of retiring Police Officers and new beneficiaries are assumed to elect a three-year BackDROP. Police Officers who retire prior to 23 years of service are not assumed to utilize the BackDROP provisions of the plan.
13th and 14th Checks:	For purposes of estimating the cost of this asymmetric benefit, active liabilities are loaded by 0.03% and non-active liabilities are loaded by 0.1%.
Sick Leave:	For purposes of calculating Fund benefits, total service at decrement is increased by 1.0% for Firefighters and 0.2% for Police Officers to recognize inclusion of sick leave.
Decrement Methodology:	Decrement rates are independent probabilities, and all decrements are assumed to occur at the beginning of the valuation year.
Benefit Limits:	Salary and benefit limitations under IRC Sections 401(a)(17) and 415 are disregarded for purposes of determining the valuation liabilities.
Actuarial Value of Assets:	Market value of assets less unrecognized returns in each of the last five years. Unrecognized return is equal to the difference between the actual market return and the expected return on the market value, and is recognized over a five-year period, further adjusted, if necessary, to be within 20% of the market value.
Actuarial Cost Method:	Entry Age Actuarial Cost Method. Entry Age is age at the member's hire date. Normal Cost and Actuarial Accrued Liability are calculated on an individual basis and are based on costs allocated as a level percentage of compensation.

Section 4: Actuarial Valuation Basis

Justification for Change in Actuarial Assumptions and Methods:	A comprehensive Actuarial Experience Review, covering the period October 1, 2014 through December 31, 2018, was completed in 2019. As a result of that study, the following assumption changes were proposed by the actuary and subsequently were approved by the Board. These changes are reflected for the first time in this valuation: • The pre-retirement mortality assumption was changed from the sex-distinct RP-2014 Employee Mortality Table, with rates loaded 7% for females, to the PUBS-2010 Safety Employee Amount-Weighted Table for males and females. • The post-retirement mortality assumption for healthy annuitants was changed from the sex-distinct RP-2014 Healthy Annuitant Mortality Table, with rates loaded 7% for females, to the PUBS-2010 Safety Healthy Retiree Amount-Weighted Table for males and females. • The mortality assumption for disabled retirees was changed from the sex-distinct RP-2014 Healthy Annuitant Mortality Table, set forward six years, with rates loaded 7% for females, to the PUBS-2010 Safety Disabled Retiree Amount-Weighted Table for males and females. • The mortality assumption for beneficiaries was changed from the sex-distinct RP-2014 Healthy Annuitant Mortality Table, with rates loaded 7% for females, to the PUBS-2010 Safety Contingent Survivor Amount-Weighted Table for males and females. • The generational projection scale was changed from 50% of the sex-distinct Scale MP-2014 projected from 2014 to Scale SSA2019-2D projected from 2010. • The existing service-based retirement rates for both Fire and Police were modified to more accurately reflect observed retirement patterns. • The assumption for BackDROP utilization was decreased from 95% to 90% for Firefighters. • The load for marriage after retirement was reduced from 0.35% to 0.20% for retirees and from 0.80% to 0.40% for disabled annuitants. • Disability rates were lowered from 30% to 10% of OASDI rates for Police Officers. • The age-based withdrawal rates for both Fire and Police were modified to reflect service-based rates for each group, with rates zeroing out after 20 years of service. • The service-based salary scale table was maintained for both Public Safety groups. The modified rates start at 14.00% with an ultimate rate of 3.00% after nine years of service. • The percent married assumption was increased from 90% to 95% for males and lowered from 90% to 60% for females. • The payroll growth assumption was lowered from 3.50% to 3.00%. Based on past experience and future expectations, the administrative expense assumption was increased from $3,200,000 to $3,400,000.

Exhibit II: Summary of Plan Provisions

This exhibit summarizes the major provisions of the Plan included in the valuation. It is not intended to be, nor should it be interpreted as, a complete statement of all plan provisions.

Plan Year:	January 1 through December 31
Plan Status:	Ongoing
Normal Retirement:	
Service Requirement	• 20 years of service and contributions, regardless of age
Amount	• 2.25% of Average Salary for each of the first 20 years of service, plus • 5.00% of Average Salary for each of the next 7 years of service, plus • 2.00% of Average Salary for each of the next 3 years of service, plus • 0.50% of Average Salary for each year of service thereafter, with a maximum benefit percentage of 87.50%.
Average Salary	• The average of the highest three years of annual salary during the five-year period ending on the date of retirement.
Disability:	
Eligibility	• Immediately eligible upon membership, payable after 30 days of continuous disability
Amount	• 50% of Average Salary
Catastrophic Injury Disability:	
Eligibility	• Be unable to secure any type of third-party employment, or engage in any self-employment, and as a result make an annual income below the poverty level.
Amount	• 87.50% of Average Salary
Termination Benefits:	• No benefits are vested prior to eligibility for disability or normal retirement benefits, or at death. However, a participant may receive a refund of member contributions without interest.

Section 4: Actuarial Valuation Basis

Survivor's Pre-Retirement Death Benefit (death not in line of duty): *Eligibility* *Amount*	• Immediately upon membership • *Spouse* - Participant's accrued benefit, with a minimum of 50% of average salary and a maximum based on 27 years of service. 25% of the benefit is paid to the children who are under age 18 or disabled, if any, divided equally among them. • *Children only (under age 18, or disabled)* -Participant's accrued benefit, with a minimum of 50% of average salary and a maximum based on 27 years of service. Benefits are divided equally among the children. • *Dependent parents, no wife or children* - 33% of Average Salary, if two; 25% if one. • *No dependents* - Lump sum equal to ten times the accrued retirement benefit based on service and salary at time of death, or a refund of member contributions, if greater. • *Wholly-dependent orphaned children* - 100% of the surviving spouse's benefit for life.
Survivor's Pre-Retirement Death Benefit (death in line of duty): *Eligibility* *Amount*	• Immediately upon membership • Surviving spouse and dependent children will receive a total pension equal to the salary, including longevity pay, of the member at the time of death.
Post-Retirement Death Benefit: *Amount*	• Percentage of Average Salary available for retirement benefit, with a maximum benefit based on 27 years of service, with the percentage based on the formula in effect on the date of the retiree's death minus BackDROP period; maximum benefit equal to benefit being received by retiree at death. • For marriages after retirement if the widow was married less than five years a lump sum of $15,000 is payable and if the widow was married at least five years than the widow is eligible for the entire death benefit of a surviving spouse starting at age 55. • If a retiree dies leaving no beneficiaries, the estate is entitled to an amount equal to ten times the annual annuity awarded on the date of retirement, minus any payments already made to the retiree.
Cost-of-Living Adjustments:	• If retirement was before October 1, 1999, the benefits are adjusted annually by 100% of the CPI, provided the index shows an increase, if the percentage increase is 8% or less. If the increase is more than 8%, the benefits shall be increased by 8% plus a percentage equal to 75% of the percentage increase that is more than 8%. If retirement is on or after October 1, 1999, benefits are adjusted by 75% of the CPI.
13th and 14th Pension Checks:	• The Board may authorize the disbursement of a 13th pension check in a year in which the arithmetic average of the annual rates of return for the most recent five years exceeds the assumed rate by at least 100 basis points. A 14th check may be authorized if the five-year average return exceeds the assumed rate by at least 300 basis points.

Section 4: Actuarial Valuation Basis

BackDROP:	
Eligibility	• Participants who are eligible to retire may elect a BackDROP. (Not applicable to line-of-duty or disability). The surviving spouse of an active member may elect a BackDROP, but the service upon which the spousal BackDROP benefit is based may not exceed 27 years of service.
Amount	• The backward deferred retirement option plan (BackDROP) benefit provides a lump sum payment based on pay and service as of the BackDROP retirement date times the number of months elected in exchange for a reduced monthly benefit. The monthly benefit is based on pay and all service as of the BackDROP retirement date plus sick leave credit.
BackDROP Retirement Date	• Actual retirement date minus number of months elected. The number of months cannot exceed the lesser of 60 months or the number of months of service in excess of 20 years.
Contributions:	
Member contributions	• Members pay 12.32% of total salary, excluding overtime pay
City contributions	• The City pays 24.64% of total salary, excluding overtime pay
Changes in Plan Provisions:	There have been no changes in plan provisions since the last valuation.

9129628v1/05544.001