AGENDA

DALLAS POLICE & FIRE PENSION SYSTEM

Date: September 7, 2018

The second of two annual public meetings of the Dallas Police and Fire Pension System Board of Trustees as required by Section 3.01 (j-9) of Article 6243a-1 of Vernon's Revised Civil Statutes will be held at **8:30 a.m. on Thursday, September 13, 2018, in the Second Floor Board Room at 4100 Harry Hines Boulevard, Dallas, Texas.** Items of the following agenda will be presented to the Board:

1. **Report on the health and performance of the Pension System**

   a. January 1, 2018 Actuarial Valuation
   b. Projected Change in Net Position Bridge Chart

2. **Public comment**

The term "possible action" in the wording of any Agenda item contained herein serves as notice that the Board may, as permitted by the Texas Government Code, Section 551, in its discretion, dispose of any item by any action in the following non-exclusive list: approval, disapproval, deferral, table, take no action, and receive and file. At the discretion of the Board, items on this agenda may be considered at times other than in the order indicated in this agenda.

At any point during the consideration of the above items, the Board may go into Closed Executive Session as per Texas Government Code, Section 551.071 for consultation with attorneys, Section 551.072 for real estate matters, Section 551.074 for personnel matters, and Section 551.078 for review of medical records.

DALLAS POLICE & FIRE PENSION SYSTEM

DISCUSSION SHEET

ITEM #1

Topic: **Report on the health and performance of the Pension System**

a. January 1, 2018 Actuarial Valuation
b. Projected Change in Net Position Bridge Chart

Attendees: Jeff Williams, Vice President and Consulting Actuary, Segal Consulting
Deborah Brigham, Vice President and Consulting Actuary, Segal Consulting

Discussion:

a. Jeff Williams and Deborah Brigham of Segal Consulting, DPFP's actuarial firm, will be present to discuss results of the January 1, 2018 actuarial valuation report, including the GASB No. 67 actuarial valuation.

b. On a quarterly basis staff presents a Change in Net Position Bridge chart based on actual historical data as part of the quarterly financial statement reporting. The Board requested that the same type of information be presented based on projected data. Staff will present similar information contained in the Change in Net Position Bridge chart based on projected data from the January 1, 2018 Actuarial Valuation report.

Sec. 3.01 (j-9) of Article 6243a-1 of Vernon's Revised Civil Statutes
Required Public Meeting – Thursday, September 13, 2018

ANNUAL VALUATION SUMMARY AS OF JANUARY 1, 2018

Board of Trustees Meeting

September 13, 2018

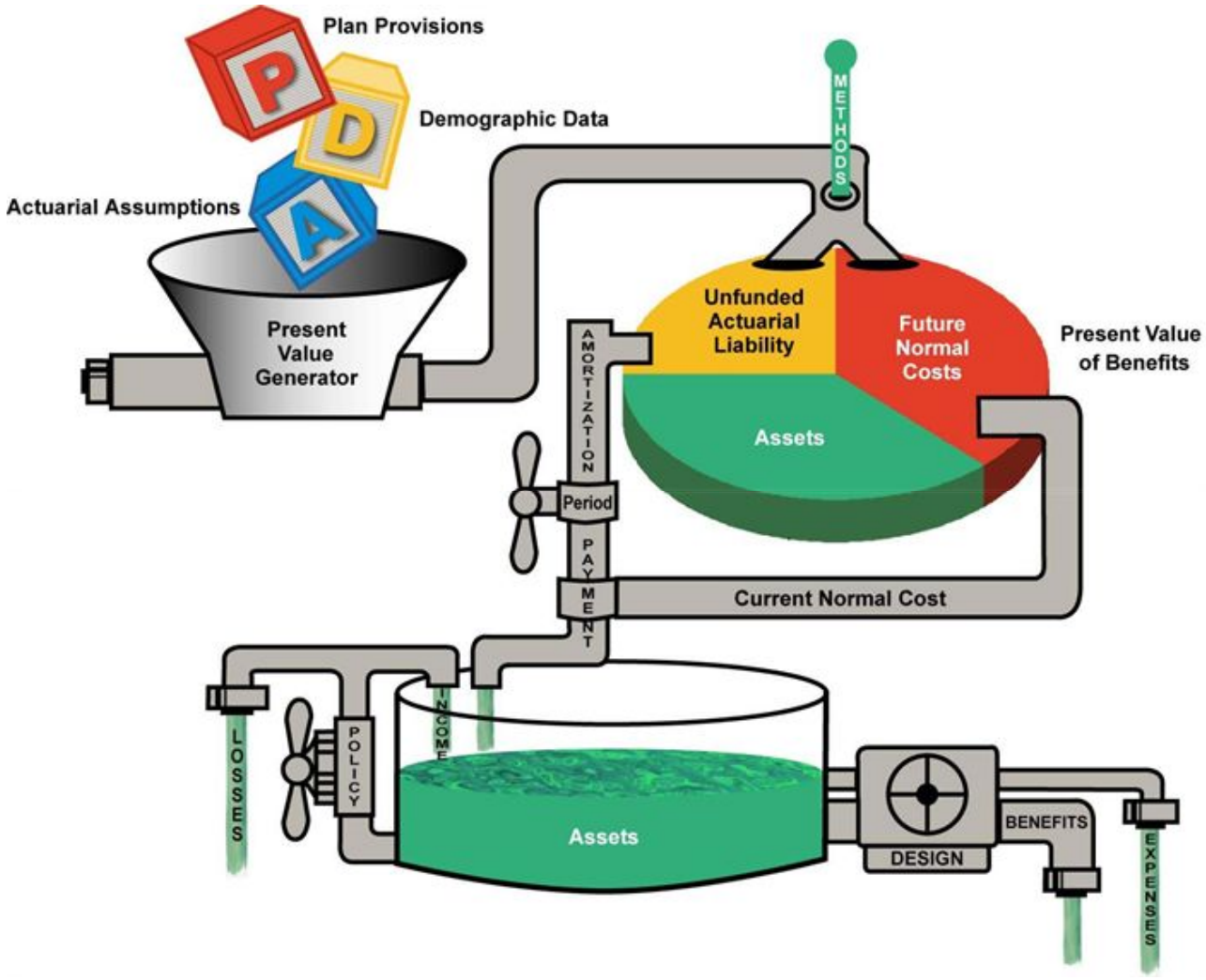
Dallas Police and Fire Pension System

Segal Consulting

Agenda

1. Portrait of a Pension Valuation
2. Summary of January 1, 2018 Actuarial Valuation Results
3. Summary of Data
4. Historical Results
5. Solvency Projection
6. Importance of Accurate Payroll Projections
7. GASB Accounting Disclosures
8. Supplemental Plan Results

Portrait of a Pension Valuation



Segal Consulting 3

COMBINED PLAN RESULTS

Summary of 2018 Actuarial Valuation Results

- The plan changes implemented by HB 3158, which was passed on May 31, 2017, are now fully recognized in the System's actuarial results.
  - The valuation includes the impact of participants who were allowed to revoke their DROP between Sept. 1, 2017 and Feb. 28, 2018
- The following assumption changes are included in this valuation:
  - Interest rate assumption on DROP balances as of Sept. 1, 2017 for future retirees is increased from 2.75% to 3.00%
  - Ad-hoc COLA now assumed to begin Oct. 1, 2053; last year it was assumed to begin Oct. 1, 2049
  - Administrative expense assumption was lowered from $10 million to $8.5 million
- Actuarially determined employer contribution (ADEC) based on a 30-year amortization of the System's unfunded actuarial accrued liability, in accordance with Texas Code Section 802.101
  - Actual City contributions expected to be less than the ADEC
  - Unfunded liability is projected to be paid off in 45 years, based on City's Hiring Plan payroll projections

Summary of 2018 Actuarial Valuation Results

- City's ADEC for 2018 is $157.1 million (45.40% of computation pay)
  - Decrease from $168.9 million (47.25% of pay) in 2017, because the members are paying more than last year (now 13.50% of pay)
  - Actual City contribution for 2018 expected to be $151.9 million ($5.344 million for 26 pay periods, plus $13 million)
- Actuarial value of assets remained level at $2.2 billion from last year to this year; market value declined by about $46 million
  - Assumed rate of return is 7.25%
  - Actual market return was 4.74%
  - Actuarial return was 6.63%
  - Actuarial value is 102.3% of market on the valuation date

- The funded ratio decreased from 2017 to 2018:
  - From 49.4% to 47.7% on an actuarial basis
  - From 49.2% to 46.7% on a market basis
  - Ratio is projected to decrease further before beginning to rise

Summary of 2018 Actuarial Valuation Results

- Reconciliation of the City's ADEC (30-year amortization), shown below:
  - 2017 ADEC **$168.9M**, or **47.25%** of pay
  - 2018 ADEC, prior to any changes **$173.2M,** or **50.04%** of pay
  - 2018 ADEC, reflecting 13.50% member contrib. rate for full year **$158.3M**, or **45.76%** of pay
  - 2018 ADEC, after DROP revocations **$160.0M**, or **46.23%** of pay
  - 2018 ADEC, after assumption changes **$157.1M**, or **45.40%** of pay

Note: Pay shown is computation pay, as provided in the System's valuation data

Summary of 2018 Actuarial Valuation Results

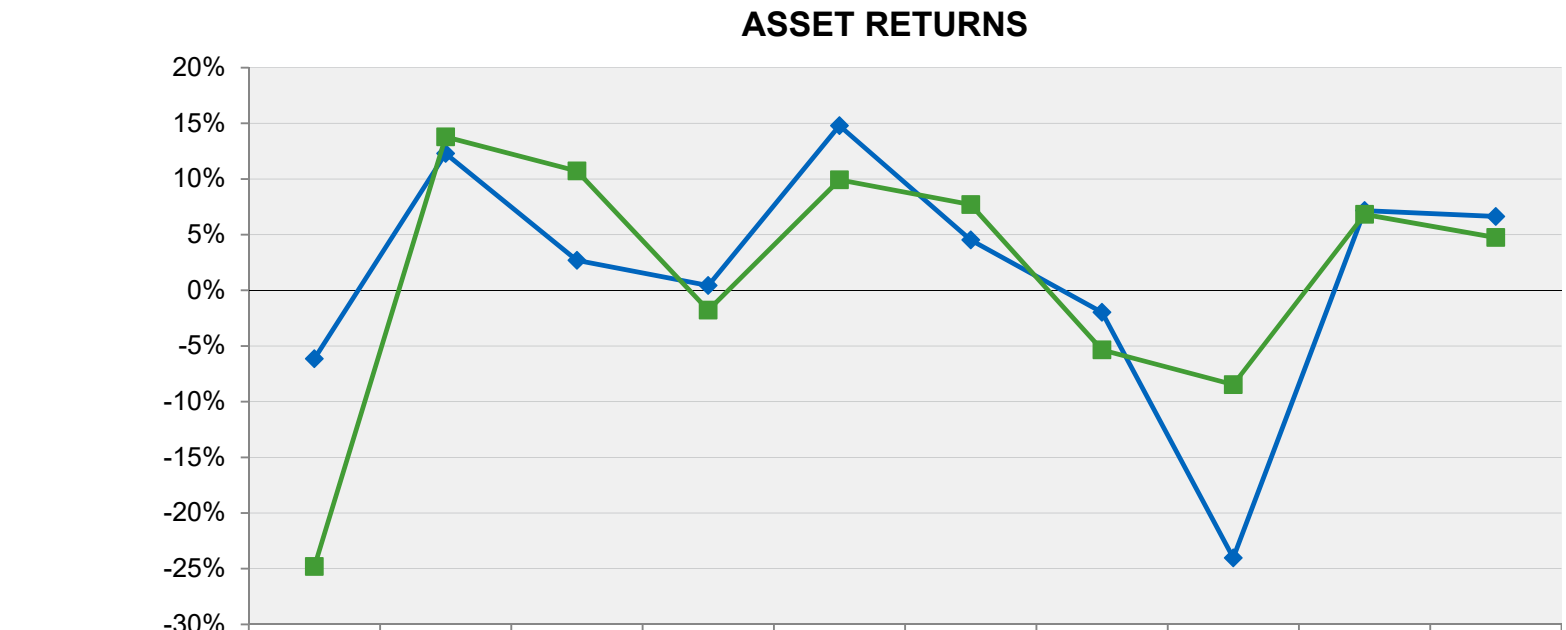
	As of 1/1/2018	As of 1/1/2017
Total Normal Cost, Including Administrative Expenses	$61,892,453	$68,422,682
Expected Member Contributions	-46,714,953	-33,475,626
Employer Normal Cost	$15,177,500	$34,947,056
Total Normal Cost as a % of Computation Pay	17.89%	19.14%
Employer Normal Cost as a % of Computation Pay	4.39%	9.78%
Actuarial Accrued Liability	$4,505,437,185	$4,367,180,454
Actuarial Value of Assets	-2,151,039,343	-2,157,799,730
Unfunded Liability	$2,354,397,842	$2,209,380,724
Funded Ratio	47.74%	49.41%
Computation Payroll	$346,036,690	$357,414,472
Actuarially Determined Employer Contribution, in dollars	**$157,100,128**	**$168,865,484**
Actuarially Determined Employer Contribution, as a percentage of computation pay	**45.40%**	**47.25%**
100% Projected Funded Status Year, based on City's Hiring Plan Payroll	**2063**	**2061**

Summary of Data

	Years Ended December 31,		
	2017	2016	Change
Active Members			
Number	4,952	5,104	-152 members
Average Age	40.6	41.4	-0.8 years
Average Service	13.4	14.3	-0.9 years
Average Computation Pay	$69,878	$70,026	-0.2%
Number in DROP	626	1,102	-476 members
Total DROP Accounts	$241.4M	$356.4M	-$115.0M
Retirees and Beneficiaries			
Number[1]	4,748	4,456	+292 members
Average Monthly Payment[2]	$4,171	$4,102	+1.7%
Terminated Vested Members			
Number	226	215	+11 members

[1]Includes beneficiaries with DROP accounts only
[2]Includes benefit supplement

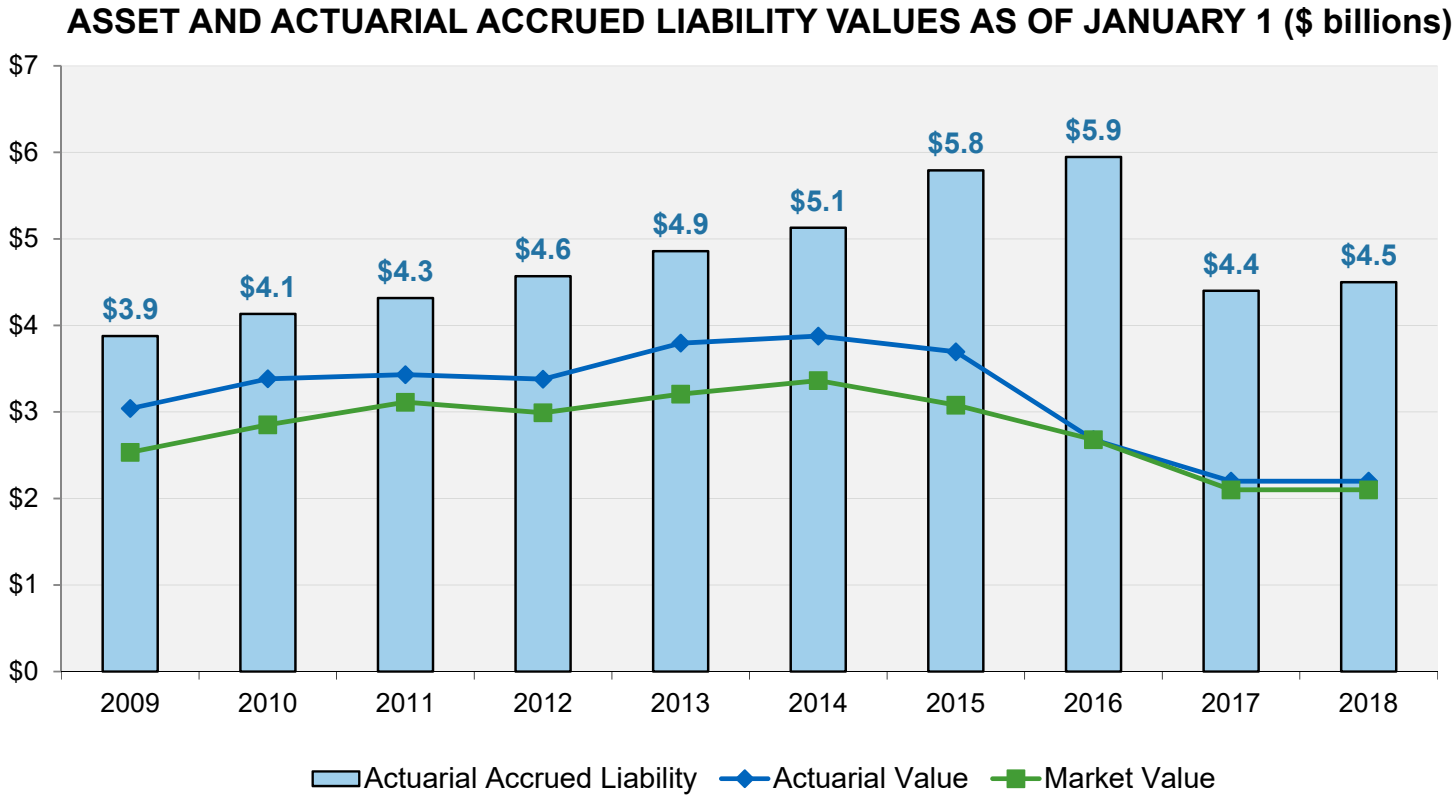
Historical Results



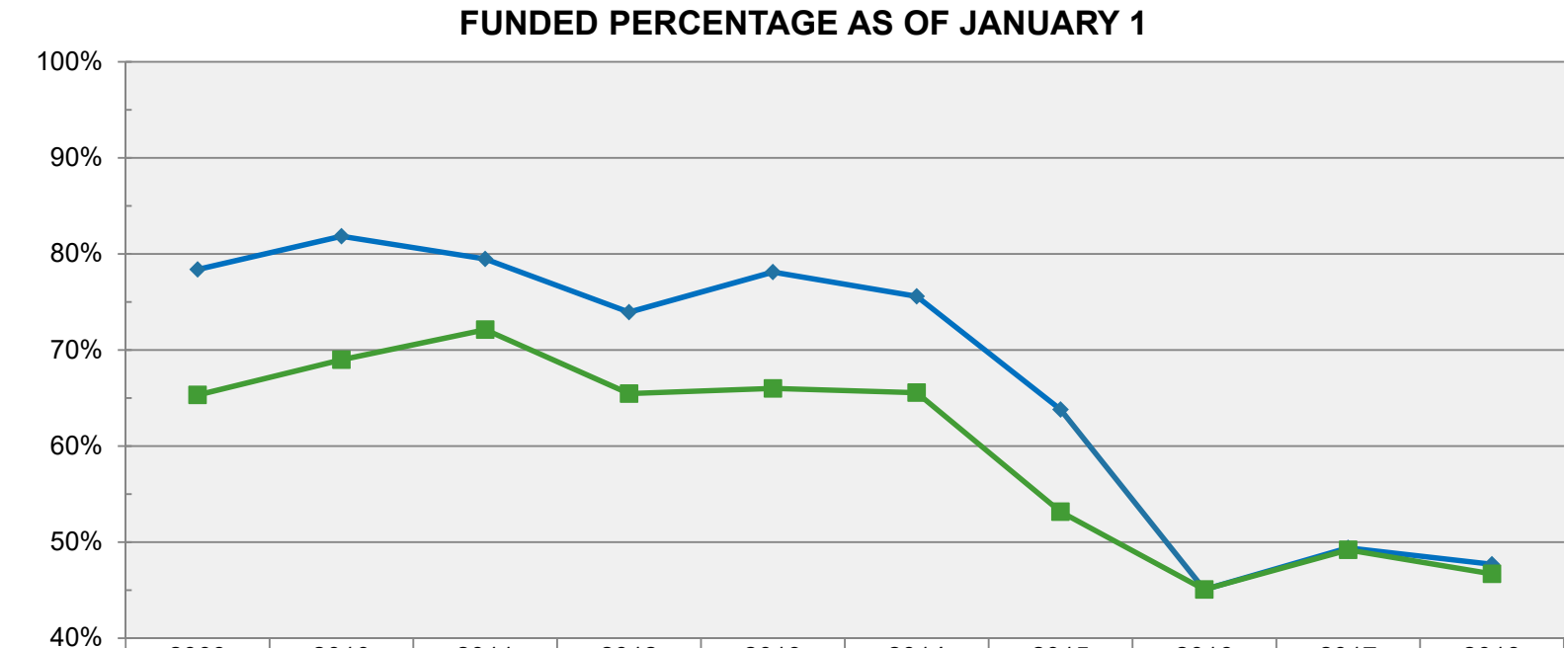
	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017
Actuarial Value	-6.14%	12.29%	2.69%	0.43%	14.79%	4.52%	-1.98%	-24.03%	7.16%	6.63%
Market Value	-24.80%	13.78%	10.72%	-1.78%	9.92%	7.70%	-5.35%	-8.47%	6.82%	4.74%

Note: The actuarial returns for 2012 and 2015 include the effects of changes in asset method

Historical Results



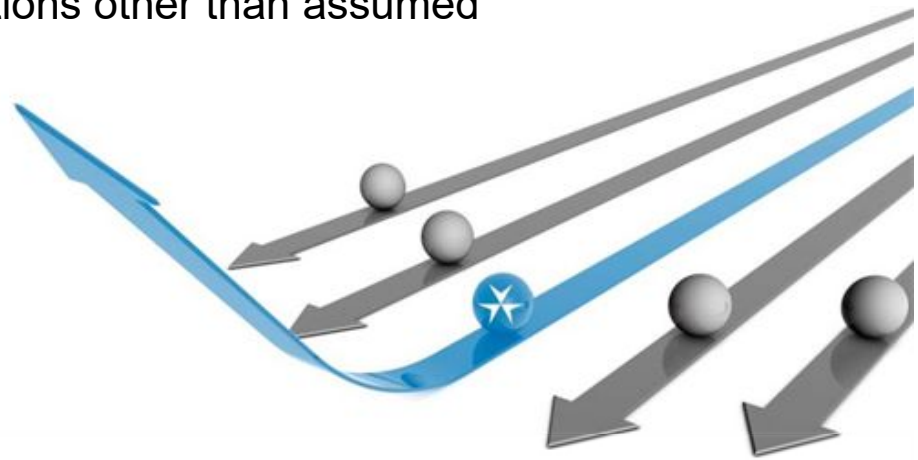
Historical Results



	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018
AVA	78.4%	81.8%	79.5%	73.9%	78.1%	75.6%	63.8%	45.1%	49.4%	47.7%
MVA	65.3%	69.0%	72.1%	65.5%	66.0%	65.6%	53.2%	45.1%	49.2%	46.7%

The Importance of Accurate Payroll Projections

- Segal Consulting ("Segal") strongly recommends an actuarial funding method that targets 100% funding of the actuarial accrued liability.
- Payments should be enough to cover normal cost, interest on the unfunded actuarial accrued liability and, ultimately, the principal balance.
- The funding policy adopted by the State in HB 3158 meets this standard, **if** the City's Hiring Plan payroll projections come to fruition.
- Assuming the City's Hiring Plan payroll projection is met, the expected full-funding date is 2063.
  - Full-funding date may vary on an annual basis due to demographic experience, economic experience, and contributions other than assumed



The Importance of Accurate Payroll Projections, contd.

- Through the first two years of the policy (2017 and 2018), valuation payroll based on participant data is cumulatively $32.5 million less than the City's projections
- City's long-term contribution rate is scheduled to be 34.50% of computation pay
  - Through 2024 there is a floor on the City's contribution levels
  - Beginning in 2025, City expected to contribute based solely on pay
  - City's plan reflects significant growth in payroll over 20 years, from $372 million in 2017 to $684 million in 2037 (average annual growth of 3.1%)
  - Differences between actual payroll and City's Hiring Plan payroll will have an impact on when the System is projected to become fully funded
  - If payroll growth is more modest, or if there is adverse experience in the System that leads to losses, the period required to achieve 100% funding could be significantly longer.
  - **If the City's Hiring Plan projections are not met and instead the current valuation payroll of $346.0 million increases by the assumed payroll growth of 2.75% each year ongoing, and if City and member contributions are based on this projected payroll beginning in 2025, the System is projected to be only 33% funded in 2063, rather than 100%.**

City's Hiring Plan Payroll vs. Projected Valuation Payroll

Year	City's Hiring Plan Payroll	Projected Valuation Payroll	$ Difference
2017	$372,000,000	$357,414,472	-$14,585,528
2018	364,000,000	346,036,690	-17,963,310
2019	383,000,000	355,552,699	-27,447,301
2020	396,000,000	365,330,398	-30,669,602
2021	408,000,000	375,376,984	-32,623,016
2022	422,000,000	385,699,851	-36,300,149
2023	438,000,000	396,306,597	-41,693,403
2024	454,000,000	407,205,029	-46,794,971
2025	471,000,000	418,403,167	-52,596,833
2026	488,000,000	429,909,254	-58,090,746
2027	507,000,000	441,731,758	-65,268,242
2028	525,000,000	453,879,382	-71,120,618
2029	545,000,000	466,361,065	-78,638,935
2030	565,000,000	479,185,994	-85,814,006
2031	581,000,000	492,363,609	-88,636,391
2032	597,000,000	505,903,608	-91,096,392
2033	614,000,000	519,815,957	-94,184,043
2034	631,000,000	534,110,896	-96,889,104
2035	648,000,000	548,798,946	-99,201,054
2036	666,000,000	563,890,917	-102,109,083
2037	684,000,000	579,397,917	-104,602,083
			-$1,336,324,810

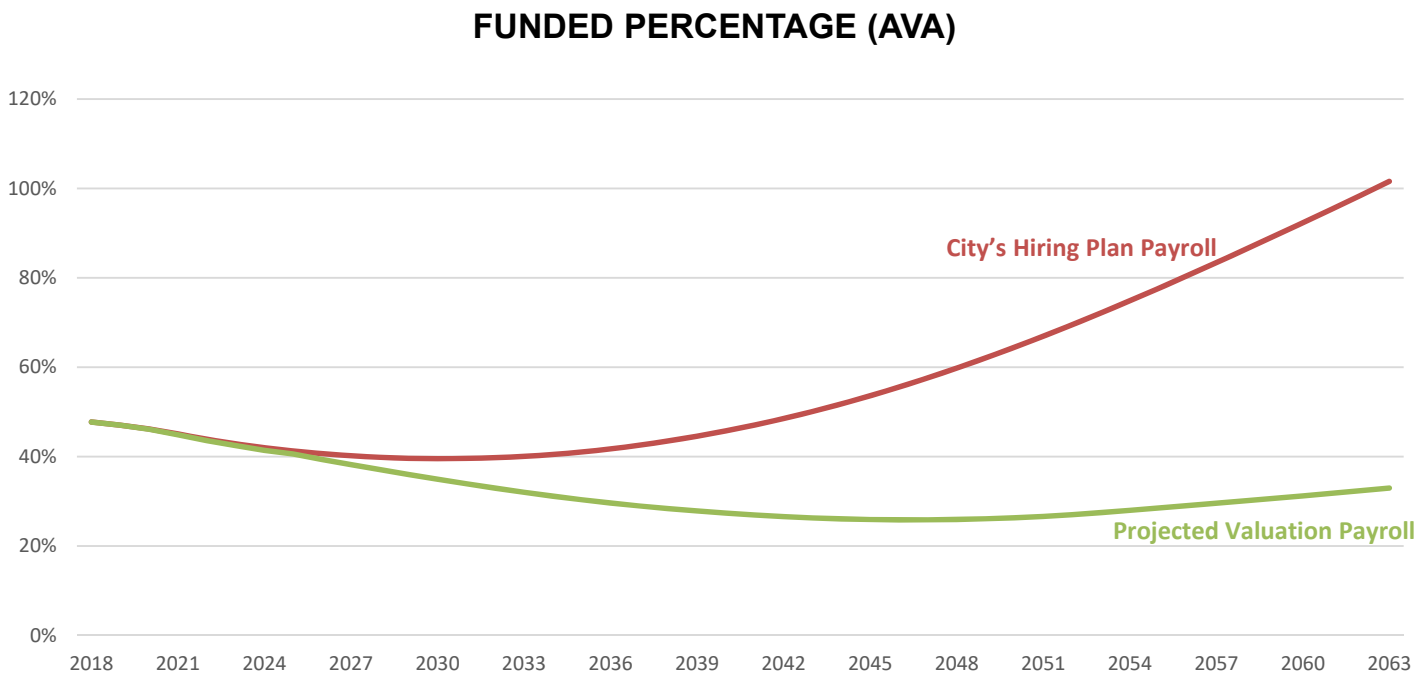
Assumptions:

- Valuation payroll projected at 2.75% per year
- Beginning in 2025, the statutory contributions cease and City contributions equal 34.5% of actual computation pay
- Member contributions: 13.5% of computation pay

Findings:

- Total City and Member contributions between 2025 and 2037, based on the City's Hiring Plan payroll projections: **$3.611 Billion**
- Total City and Member contributions between 2025 and 2037, based on projected valuation payroll: **$3.088 Billion**
- Difference in total contributions based on these two projections, just for the period of 2025 through 2037: **$523 Million**

Funded Percentage Projection



The projection above anticipates that all actuarial assumptions are met in the future and all contributions are made as expected. Projections are based on the City's Hiring Plan payroll projections through 2037 for the "City's Hiring Plan Payroll" projection. The "Projected Valuation Payroll" uses the actual January 1, 2018 payroll projected forward each year at the 2.75% growth assumption.

Based on the City's Hiring Plan payroll projections, 100% funding is projected by January 1, 2063. Based on the projected valuation payroll, the funded percent is projected to be 33% on January 1, 2063.

GASB 67 Accounting Disclosures – Net Pension Liability

- The Pension System is required to provide disclosures under GASB Statement 67. The components of the net pension liability are as follows:

	Year Ended December 31, 2017	Year Ended December 31, 2016
Total Pension Liability	$4.50 billion	$8.45 billion
Plan Fiduciary Net Position	$2.10 billion	$2.15 billion
City's Net Pension Liability	$2.40 billion	$6.30 billion
Plan Fiduciary Net Position as a percentage of the Total Pension Liability	46.77%	25.45%

- Total Pension Liability as of December 31, 2017 includes the plan changes effective September 1, 2017, but does not include the DROP revocations between September 1, 2017 and February 28, 2018.
- In the event that a pension plan has a projected insolvency date, GASB requires that the unfunded benefits be discounted using a 20-year, tax-exempt general obligation bonds rate rather than the Plan's funding rate.
- Based on HB 3158 contribution requirements and the City's Hiring Plan (90% of which was used for projecting computation pay for GASB purposes), City and member contributions are projected be able to pay the benefits of current members. Therefore, GASB liabilities as of December 31, 2017 are determined using the valuation discount rate of 7.25%. (The rate was 4.12% as of December 31, 2016).

SUPPLEMENTAL PLAN RESULTS

Supplemental Plan Results

- City of Dallas contributes to the Supplemental Plan each year based on the normal cost (net of member contributions) and a ten-year amortization of the unfunded actuarial accrued liability
- Same assumption changes implemented for the Combined Pension Plan apply to the Supplemental Plan, with the exception of administrative expenses
- Total recommended contribution for the Supplemental Plan increased from $2.13 million in 2017 to $2.41 million in 2018
  - City's portion increased from $2.09 million to $2.27 million
- Supplemental Plan net assets increased from $17.7 million to $17.8 million
- Funded ratio decreased from 52.9% to 51.5%
- Number of active members decreased from 47 to 44
- Number of annuitants increased from 128 to 140
- GASB net pension liability (NPL) is determined using the valuation discount rate of 7.25%, up from the blended rate of 7.10% last year
  - NPL decreased from $23.0 million last year to $15.9 million

Caveats

- This presentation is intended for the use of the Board of Trustees for the Dallas Police and Fire Pension System, and is a supplement to Segal Consulting's full valuation reports for the System as of January 1, 2018.
- Please refer to the full valuation reports for a description of assumptions and plan provisions reflected in the results shown in this presentation. The reports also include more comprehensive information regarding the System's membership, assets, and experience during the most recent plan year.
- Projections, by their nature, are not a guarantee of future results. They are intended to serve as estimates of future financial outcomes that are based on assumptions about future experience and the information available to us at the time the modeling is undertaken and completed. The projected future results included in this presentation show how the System would be affected if specific investment return, salary, mortality, turnover, disability and retirement assumptions are met. Actual results may differ due to such variables as demographic experience, the economy, contribution patterns, stock market performance and the regulatory environment.
- The calculations included in this presentation were completed under the supervision of Jeffrey S. Williams, FCA, ASA, MAAA, EA, and Deborah K. Brigham, FCA, ASA, MAAA, EA.

Questions?

Segal Consulting
2018 Powers Ferry Road, Suite 850
Atlanta, GA 30339-7200
T 678.306.3147
jwilliams@segalco.com

Jeffrey S. Williams, FCA, ASA, MAAA, EA
Vice President and Consulting Actuary

Segal Consulting
2018 Powers Ferry Road, Suite 850
Atlanta, GA 30339-7200
T 678.306.3112
dbrigham@segalco.com

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

Dallas Police and Fire Pension System

Actuarial Valuation and Review as of January 1, 2018

Segal Consulting
2018 Powers Ferry Road, Suite 850 Atlanta, GA 30339-7200
T 678.306.3100 www.segalco.com

September 10, 2018

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

Dear Board Members:

We are pleased to submit this Actuarial Valuation and Review as of January 1, 2018. It summarizes the actuarial data used in the valuation, analyzes the preceding year's experience, and establishes the actuarially determined funding requirements for fiscal 2018; actual funding is determined by State law.

This report was prepared in accordance with generally accepted actuarial principles and practices at the request of the Board to assist in administering the Retirement System. The census information on which our calculations were based was prepared by the System's IT department, under the supervision of John Holt, and the financial information was provided by the System's Finance Department. That assistance is gratefully acknowledged.

The actuarial calculations were directed under our supervision. We are members of the American Academy of Actuaries and we meet 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 System with the presumption that appropriate action is taken to address the System's funding issues.

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

Sincerely,

Segal Consulting, a Member of The Segal Group, Inc.

By: _____ _____

Jeffrey S. Williams, FCA, ASA, MAAA, EA
Vice President and Consulting Actuary

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

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Dallas Police and Fire Pension System Actuarial Valuation and Review as of January 1, 2018

Section 1: Actuarial Valuation Summary

Purpose and Basis

This report was prepared by Segal Consulting to present a valuation of the Dallas Police and Fire Pension System as of January 1, 2018. The valuation was performed to determine whether the assets and contributions are sufficient to provide the prescribed benefits and to provide information for required disclosures under Governmental Accounting Standards Board (GASB) Statement No. 67. 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 Plan assets to cover the estimated cost of settling the Plan'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.

Certain disclosure information required by GASB Statement No. 68 as of September 30, 2018 for the City will be provided in a separate report.

The contribution requirements presented in this report are based on:

- The benefit provisions of the Pension System, as administered by the Board;
- The characteristics of covered active members, inactive vested members and inactive members due a refund of contributions, and retired members and beneficiaries as of December 31, 2017, provided by the System's IT Department;
- The unaudited assets of the Plan as of December 31, 2017, provided by the System's Finance Department;
- Economic assumptions regarding future salary increases and investment earnings;
- Other actuarial assumptions regarding employee terminations, retirement, death, etc. and
- The requirements of House Bill 3158 (HB 3158), signed into law by the Governor of Texas on May 31, 2017.

The majority of the assumptions and methods used to value the Plan were set by the Board based on recommendations made by Segal Consulting following a five-year experience study for the period ended December 31, 2014. Additional assumption changes were made as part of the plan changes effective September 1, 2017, as well as the Meet and Confer Agreement for salary scale purposes through 2019. Assumptions are reviewed and updated annually as needed.

Significant Issues

1. Segal Consulting ("Segal") strongly recommends an actuarial funding method that targets 100% funding of the actuarial accrued liability. Generally, this implies payments that are ultimately at least enough to cover normal cost, interest on the unfunded actuarial accrued liability and the principal balance. The funding policy adopted by the State in HB 3158 meets this standard, if the City's Hiring Plan payroll projections come to fruition. Assuming the City's Hiring Plan payroll projection materializes, the expected full-funding date is 2063 (last year's projected date was 2061). The City's Hiring Plan payroll projections are shown in Exhibit I of Section 4 of this report. Through the first two years of the policy (2017 and 2018), valuation payroll based on participant data is cumulatively $32.5 million less than the City's projections. This is an area of concern that needs to be carefully monitored.
2. The total contributions made during the plan year ending December 31, 2017 were insufficient to reduce the unfunded actuarial accrued liability. The unfunded actuarial accrued liability on the valuation date is $2.35 billion, which is an increase of $0.15 billion since the prior valuation. This increase is not unexpected, although the increase is greater than had been expected; based on the 2017 valuation, the unfunded actuarial accrued liability had been projected to be $2.30 billion as of January 1, 2018. The Board was advised last year that, because the funding policy contributions result in a long effective amortization period, it could be 20 years before the unfunded liability starts to decline and the funded ratio (the ratio of assets to actuarial accrued liability) begins to rise.
3. The funded ratio on an actuarial basis is 47.7%, compared to the prior year funded ratio of 49.4%. 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 46.7%, compared to 49.2% as of the prior valuation date. Based on the 2017 valuation, the funded ratio had been projected to be 48.4% on an actuarial value basis and 47.3% on a market value basis.
4. The projected year of full funding is 2063, but this may vary on an annual basis due to demographic experience, economic experience, and contributions other than assumed. Through 2024 there is a floor on the City's contribution levels, which is expected to override the long-term contribution rate of 34.50% of computation pay. Beginning in 2025, when the City is expected to contribute based solely on computation pay, differences between actual payroll and the City's Hiring Plan payroll will have an impact on when the System is projected to become fully funded. The City's plan reflects significant growth in payroll over 20 years, from $372 million in 2017 to $684 million in 2037. The average annual growth in the City's payroll projections is 3.09%, compared to the valuation assumption of 2.75%. If payroll growth is more modest, or if there is adverse experience in the System that leads to losses, the period required to achieve 100% funding could be significantly longer.
5. If the City's Hiring Plan projections are not met and instead the current valuation payroll of $346.0 million increases by the assumed payroll growth of 2.75% each year ongoing, and if City and member contributions are based on this projected payroll beginning in 2025, the System is projected to be only 33% funded in 2063, rather than 100% funded.

6. Although it is important for the System to meet its 7.25% rate of return assumption on an annual basis, the assets currently cover a relatively low percentage of the liabilities and investment returns alone cannot close the funding gap. It is therefore also vital that Dallas' payroll projections are accurate, or that the long-term level of contributions is at least 34.50% of those payroll projections, if the System is ever to achieve full funding.
7. Texas Code Section 802.101 requires the actuarial valuations of public retirement systems to include a recommended contribution rate based on an amortization period that does not exceed 30 years. The City's actuarially determined contribution for the 2018 plan year, based on a 30-year amortization of the unfunded actuarial accrued liability, is $157.1 million, a decrease of $11.8 million from last year. The contribution as a percentage of payroll decreased from 47.25% of computation pay to 45.40% of computation pay. This decrease is the result of increased member contributions effective September 1, 2017.
8. Actual contributions made by the City during the plan year ended December 31, 2017 were $126.3 million, 74.8% of the actuarially determined contribution. In 2016, prior to plan changes under HB 3158, actual contributions were $119.4 million, 45.6% of that year's actuarially determined contribution.
9. The System's normal cost plus expenses total 17.89% of computation pay, and members contribute 13.50% of computation pay. The City's contributions cover the balance; all remaining funding from the City is allocated toward the unfunded actuarial accrued liability.
10. There was a net experience loss for the year of $64.7 million, or 1.4% of actuarial accrued liability. The majority of this loss resulted from a greater number of retirements than anticipated by the actuarial assumptions, and investment returns less than the 7.25% assumption. The magnitude of the loss as a percentage of total plan liability is not considered significant for actuarial purposes.
11. The rate of return on the market value of assets was 4.74% for the 2017 plan year. This return was on target with short-term expectations as the System works to rebalance its investment portfolio, but was roughly one-third of that of other large municipal retirement systems in Texas. As shown in Exhibit E of Section 3 of this report, the System reduced the percentage of the invested portfolio exposed to real assets from 58% to 40% over the last year. The reduction of the invested portfolio exposed to real assets and the deployment of excess cash roughly tripled the equity exposure, to 24% of the total holdings. The return on the actuarial value of assets was 6.63% for 2017. The 6.63% actuarial return resulted in a loss when measured against the assumed rate of return of 7.25%, and this actuarial investment loss increased the average employer contribution rate by 0.22% of pay. Based on the System's investment targets, Segal continues to support 7.25% as a reasonable long-term net investment return assumption. However, we will continue to monitor actual and anticipated returns.
12. The following actuarial assumptions were changed with this valuation:
    - The interest rate assumption payable upon retirement on DROP accounts as of September 1, 2017 was increased from 2.75% to 3.00%.
    - The ad-hoc COLA assumption was updated to begin October 1, 2053 based on the updated projection of the unfunded actuarial accrued liability; last year's assumption was that the COLA would begin October 1, 2049.
    - The administrative expense assumption was decreased from $10,000,000 to $8,500,000.

As a result of these assumption changes, the total normal cost decreased by $0.8 million and the actuarial accrued liability decreased by $8.8 million. The total impact was a decrease in the actuarially determined contribution of $1.4 million, or 0.39% of payroll.

13. Active members who elected DROP prior to June 1, 2017 were eligible to revoke the DROP election during the period from September 1, 2017 to February 28, 2018. This plan change is included for the first time in this valuation, and it resulted in a normal cost increase of $0.6 million and an increase in actuarial accrued liability of $20.6 million. The total impact was an increase in the actuarially determined contribution of $1.6 million, or 0.47% of payroll.
14. This actuarial report as of January 1, 2018 is based on financial and demographic data as of December 31, 2017, plus the impact of DROP revocations that occurred between January 1, 2018 and February 28, 2018. Subsequent changes are not reflected and will affect future actuarial costs of the plan.
15. This report constitutes an actuarial valuation for the purpose of determining the actuarially determined employer contribution (ADEC) under the Plan's funding policy. The information contained in Section 5 provides the accounting information for Governmental Accounting Standards Board (GASB) Statement No. 67, for inclusion in the plan and employer's financial statements as of December 31, 2017. The Net Pension Liability (NPL) and Pension Expense under Governmental Accounting Standards Board (GASB) Statement No. 68, for inclusion in the plan and employer's financial statements as of September 30, 2018, will be provided separately.
16. The Net Pension Liability (NPL) is equal to the difference between the Total Pension Liability (TPL) and the Plan's fiduciary net position (equal to the market value of assets). The NPL as of December 31, 2017 is $2.4 billion, a decrease from $6.3 billion as of December 31, 2016. Most of this $3.9 billion decrease is the result of: (1) the reflection of the plan changes under HB 3158, and (2) a higher discount rate used to value the TPL. Because the City and member contributions are now projected to be sufficient to cover the future benefit payments of current plan members, the long-term expected funding rate of 7.25% is used for the December 31, 2017 disclosure. Last year's discount rate was 4.12%.
17. 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. In addition to those described above, we have included a discussion of various risks that may affect the System in Section 2 on page 28.

Summary of Key Valuation Results

		2018	2017
Contributions for plan year beginning January 1, adjusted for timing:	• Total actuarially determined contribution (City and member)	$205,478,870	$203,533,370
	• Expected member contributions	48,378,742	34,667,886
	• City's actuarially determined contribution (ADEC)	157,100,128	168,865,484
	• City's ADEC as a percentage of computation pay	45.40%	47.25%
	• Actual City contributions	- -	126,318,005
	• Amortization period for determination of ADEC	30 years	30 years
Actuarial accrued liability for plan year beginning January 1:	• Retired members and beneficiaries	$2,989,814,931	$2,707,966,011
	• Inactive vested participants	27,386,552	25,700,499
	• Active participants	1,487,227,604	1,632,343,097
	• Inactive participants due a refund of member contributions	1,008,098	1,170,847
	• Total	4,505,437,185	4,367,180,454
	• Employer normal cost including administrative expenses	15,177,500	34,947,056
Assets for plan year beginning January 1:	• Market value of assets (MVA)	$2,103,345,471	$2,149,836,260
	• Actuarial value of assets (AVA)	2,151,039,343	2,157,799,730
	• Actuarial value of assets as a percentage of market value of assets	102.27%	100.37%
Funded status for plan year beginning January 1:	• Unfunded actuarial accrued liability on market value of assets	$2,402,091,714	$2,217,344,194
	• Funded percentage on MVA basis	46.68%	49.23%
	• Unfunded actuarial accrued liability on actuarial value of assets	$2,354,397,842	$2,209,380,724
	• Funded percentage on AVA basis	47.74%	49.41%
	• Projected year of full funding based on City's Hiring Plan payroll projections	2063	2061
Key assumptions:	• Net investment return	7.25%	7.25%
	• Inflation rate	2.75%	2.75%
	• Payroll increase	2.75%	2.75%
GASB information:	• Discount rate	7.25%	4.12%
	• Total pension liability	$4,497,347,017	$8,450,280,896
	• Plan fiduciary net position	2,103,345,471	2,150,661,803
	• Net pension liability	2,394,001,546	6,299,619,093
	• Plan fiduciary net position as a percentage of total pension liability	46.77%	25.45%
Demographic data for plan year beginning January 1:	• Number of retired members and beneficiaries	4,748	4,456
	• Number of inactive vested members	226	215
	• Number of active members	4,952	5,104
	• Number of inactive participants entitled to a refund of member contributions	399	295
	• Total computation pay	$346,036,690	$357,414,472
	• Average computation pay	69,878	70,026

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 Consulting ("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 System. Segal does not audit such data for completeness or accuracy, other than reviewing it for obvious inconsistencies compared to prior data and other information that appears unreasonable. It is important for Segal to receive the best possible data and to be informed about any known incomplete or inaccurate data.
Assets	The valuation is based on the market value of assets as of the valuation date, as provided by the System. The System 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.

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 System will be determined by the actual benefits and expenses paid and the actual investment experience of the System.
- Actuarial results in this report are not rounded, but that does not imply precision.
- If the Board 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 Consulting has no discretionary authority with respect to the management or assets of the System, it is not a fiduciary in its capacity as actuaries and consultants with respect to the System.

Section 2: Actuarial Valuation Results

Member Data

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

This section presents a summary of significant statistical data on these member groups. As can be seen below, the number of active members has decreased by nearly 10% and the number of retired members is up by almost 17% since the end of 2014.

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

MEMBER POPULATION: 2008 – 2017

Year Ended December 31	Active Members	Inactive Vested Members[1]	Retired Members and Beneficiaries	Total Non-Actives	Ratio of Non-Actives to Actives
2008	5,235	151	3,375	3,526	0.67
2009	5,476	144	3,450	3,594	0.66
2010	5,482	135	3,535	3,670	0.67
2011	5,376	128	3,669	3,797	0.71
2012	5,400	96	3,783	3,879	0.72
2013	5,397	122	3,890	4,012	0.74
2014	5,487	157	4,069	4,226	0.77
2015	5,415	200	4,230	4,430	0.82
2016	5,104	215	4,456	4,671	0.92
2017	4,952	226	4,748	4,974	1.00

[1]Excludes terminated members due a refund of member contributions

Active Members

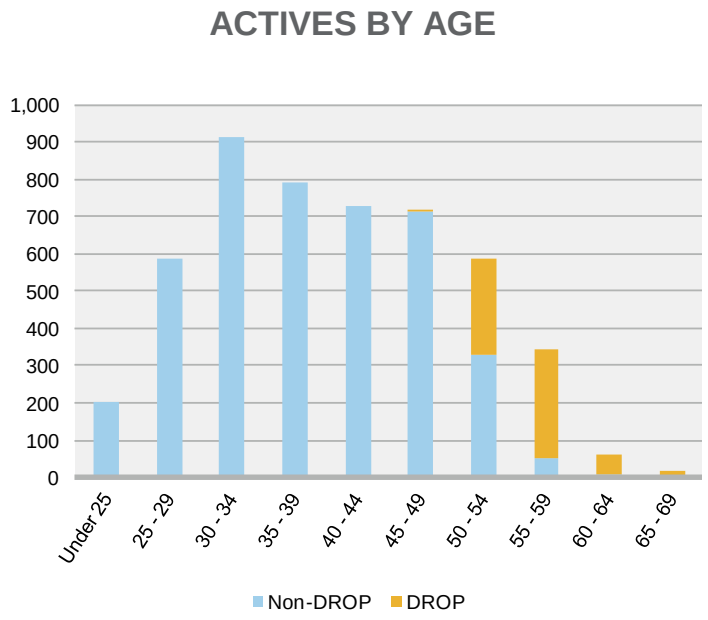
Plan costs are affected by the age, years of service and covered compensation of active members. In this year's valuation, there were 4,952 active members with an average age of 40.6, average years of service of 13.4 years and average computation pay of $69,878. The 5,104 active members in the prior valuation had an average age of 41.4, average service of 14.3 years and average computation pay of $70,026.

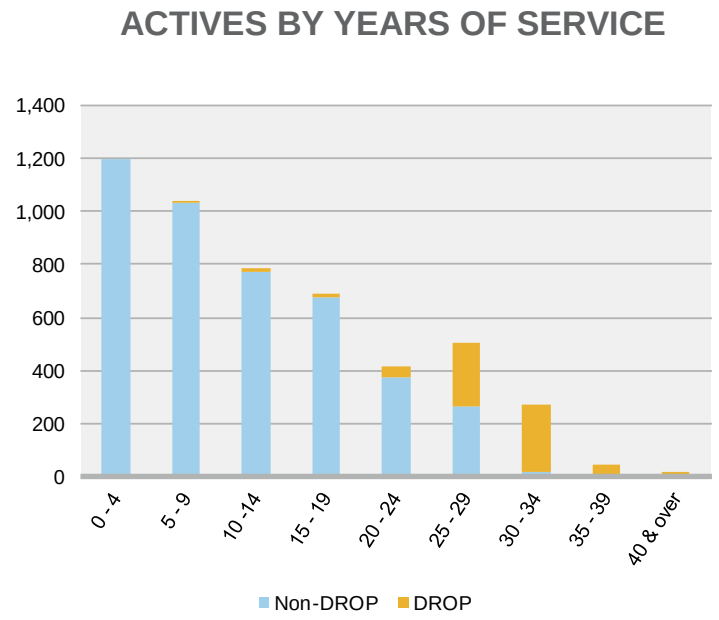
The number of active Firefighters increased from 1,849 to 1,884 as of December 31, 2017. The average age of this group is 40.5, the average years of service is 13.0, and the average computation pay is $70,049. Last year these averages were 41.7, 14.4 and $70,703, respectively.

The number of active Police Officers decreased from 3,255 to 3,068 as of December 31, 2017. The average age of this group decreased from 41.2 to 40.7, and the average years of service decreased from 14.1 to 13.6. The average computation pay increased from $69,642 to $69,773.

The number of active participants participating in DROP decreased significantly, from 1,102 at the end of 2016 to 626 at the end of 2017.

Distribution of Active Participants as of December 31, 2017





Inactive Members

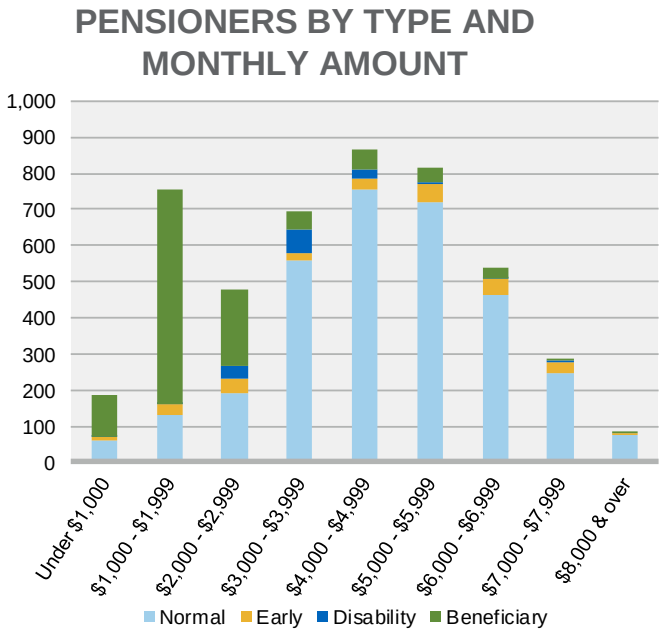
In this year's valuation, there were 226 members with a vested right to a deferred or immediate vested benefit. In addition, there were 399 members entitled to a return of their member contributions.

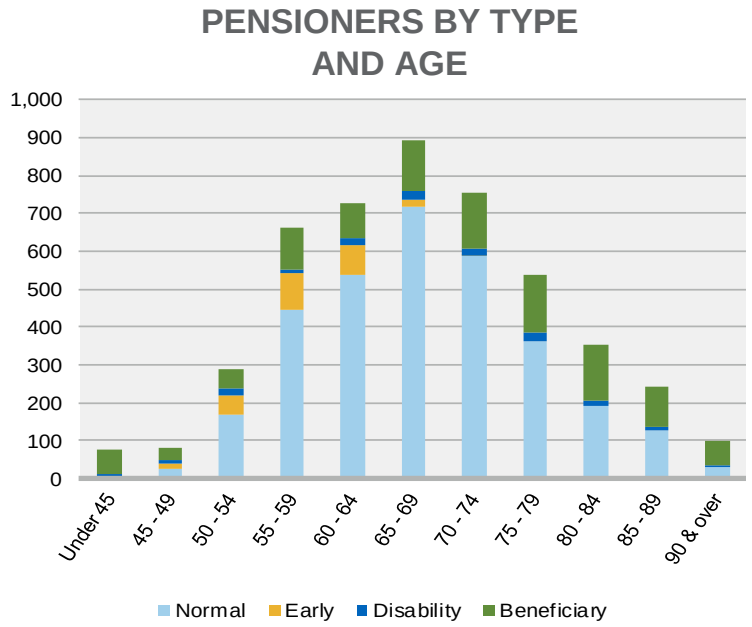
Retired Members and Beneficiaries

As of December 31, 2017, 3,598 retired members and 1,108 beneficiaries were receiving total monthly benefits of $19,629,490. For comparison, in the previous valuation, there were 3,338 retired members and 1,077 beneficiaries receiving monthly benefits of $18,104,251.

As of December 31, 2017, the average monthly benefit for retired members is $4,171, compared to $4,102 in the previous valuation. The average age for retired members is 67.7 in the current valuation, compared with 67.7 in the prior valuation. There are also 42 beneficiaries with annuitized DROP accounts only and no lifetime annuity compared to 41 beneficiaries with DROP balances only last year prior to the required annuitization.

Distribution of Pensioners as of December 31, 2017





Historical Plan Population

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

MEMBER DATA STATISTICS: 2008 – 2017

	Active Participants			Retired Members and Beneficiaries		
Year Ended December 31	Count	Average Age	Average Service	Count	Average Age[1]	Average Monthly Amount[2]
2008	5,235	41.2	14.7	3,375	--	$3,010
2009	5,476	40.9	14.3	3,450	--	3,137
2010	5,482	41.1	14.4	3,535	--	3,251
2011	5,376	41.3	14.5	3,669	--	3,380
2012	5,400	41.3	14.5	3,783	--	3,429
2013	5,397	41.3	14.4	3,890	--	3,543
2014	5,487	41.2	14.2	4,069	68.8	3,699
2015	5,415	41.4	14.3	4,182	69.0	3,826
2016	5,104	41.4	13.0	4,414	68.7	4,102
2017	4,952	40.6	13.4	4,706	67.7	4,171

[1]Information for December 31, 2013 and earlier is not available

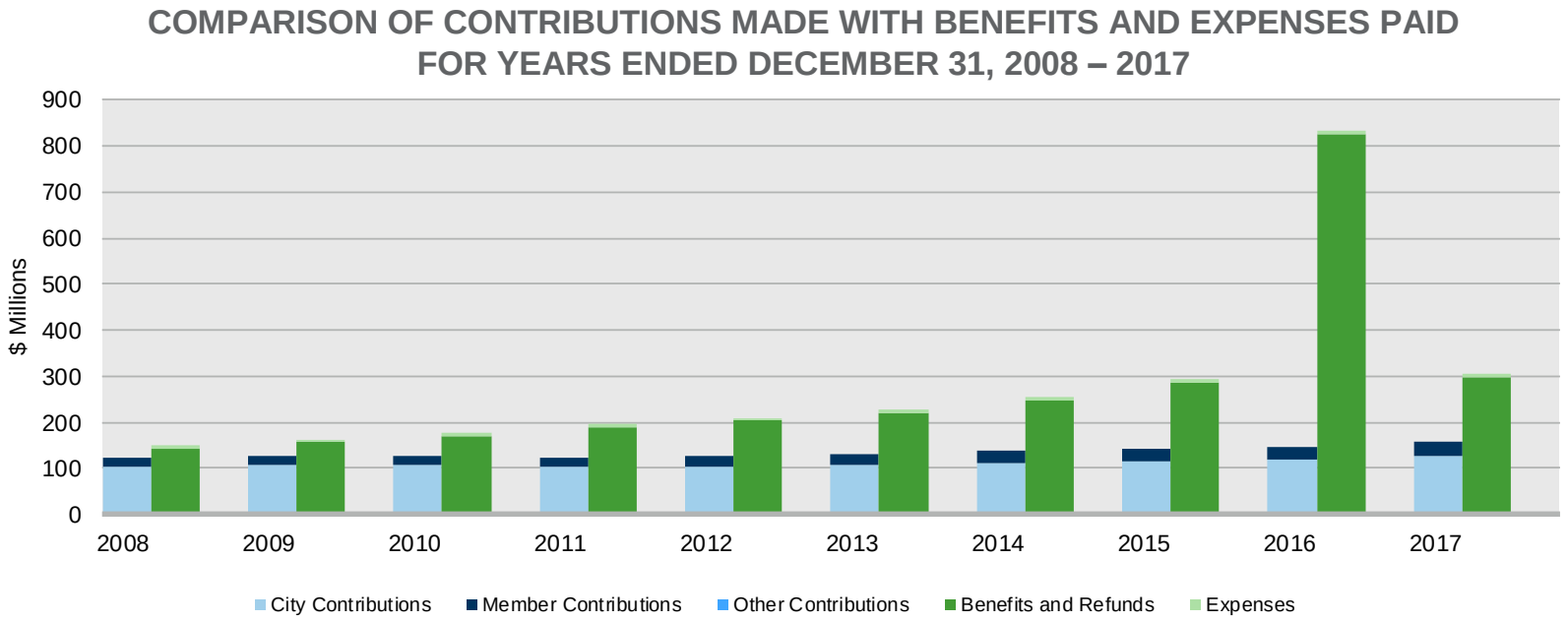
[2]Average benefits for December 31, 2013 and earlier include terminated vested members; average benefits for December 31, 2014 and later include the benefit supplement.

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.

Benefit payments in 2016 totaled $825.1 million, of which $606.3 million were DROP lump sum payments. This was a one-time event, as members reacted to pending changes in the plan provisions. DROP balances have been annuitized, which should result in more predictable benefit payment levels in the future.

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



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. The actuarial value of assets was reset to market value as of December 31, 2015, with future gains and losses after that date amortized on a straight-line basis over five years.

DETERMINATION OF ACTUARIAL VALUE OF ASSETS FOR YEAR ENDED DECEMBER 31, 2017

		Original Amount[1]	Percent Deferred	Unrecognized Amount[2]	
1.	Market value of assets, December 31, 2017				$2,103,345,471
2.	Calculation of unrecognized return				
(a)	Year ended December 31, 2017	-$52,151,589	80%	-$41,721,271	
(b)	Year ended December 31, 2016	-9,954,337	60	-5,972,601	
(c)	Total unrecognized return				-47,693,872
3.	Preliminary actuarial value: **(1) - (2c)**				$2,151,039,343
4.	Adjustment to be within 20% corridor				0
5.	Final actuarial value of assets as of December 31, 2017: **(3) + (4)**				2,151,039,343
6.	Actuarial value as a percentage of market value: **(5) ÷ (1)**				102.3%
7.	Amount deferred for future recognition[3]: **(1) - (5)**				-$47,693,872

[1]Total return minus expected return on a market value basis

[2]Recognition at 20% per year over five years

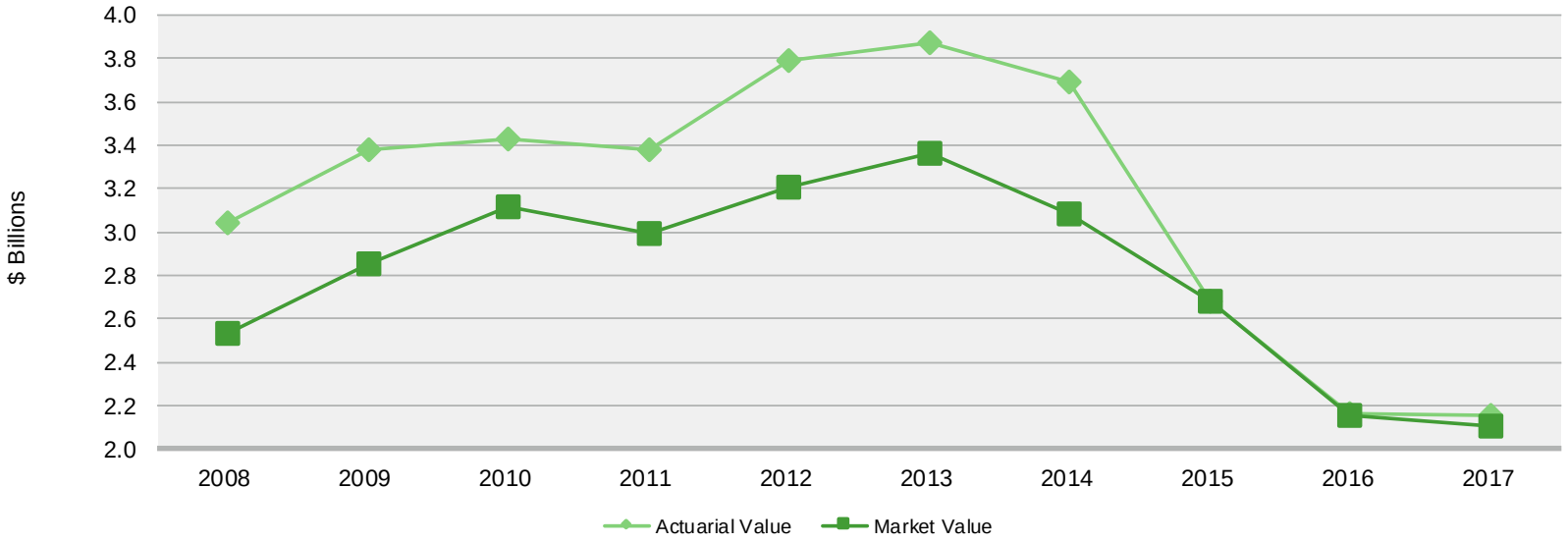
[3]Deferred return as of December 31, 2017 recognized in each of the next four years:

(a) Amount recognized on December 31, 2018	-$12,421,185
(b) Amount recognized on December 31, 2019	-12,421,185
(c) Amount recognized on December 31, 2020	-12,421,185
(d) Amount recognized on December 31, 2021	-10,430,317

Both the actuarial value and market value of assets are representations of the Plan'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 Plan's liabilities are compared to these assets to determine what portion, if any, remains unfunded.

The decline in asset values from 2013 to 2015 was primarily the result of significant write-downs in the System's asset holdings. The decline from 2015 to 2016 reflects the unusually large number of DROP payments made in 2016.

ACTUARIAL VALUE OF ASSETS VS. MARKET VALUE OF ASSETS AS OF DECEMBER 31, 2008 – 2017



Actuarial Experience

To calculate any actuarially determined 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 $64,704,517, which includes $12,998,539 from investment losses and $51,705,978 in losses from all other sources. The net experience variation from individual sources other than investments was 1.2% 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, 2017

1	Net loss from investments[1]	-$12,998,539
2	Net gain from administrative expenses	1,978,457
3	Net loss from other experience	-53,684,435
4	Net experience loss: 1 + 2 + 3	-$64,704,517

[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 Plan's investment policy. The rate of return on the market value of assets was 4.74% for the year ended December 31, 2017.

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 2017 plan year was 6.63%. Since the actual return for the year was less than the assumed return, the Plan experienced an actuarial loss during the year ended December 31, 2017 with regard to its investments.

INVESTMENT EXPERIENCE

		Year Ended December 31, 2017		Year Ended December 31, 2016	
		Market Value	Actuarial Value	Market Value	Actuarial Value
1	Net investment income	$98,457,176	$138,187,578	$159,355,111	$167,318,581
2	Average value of assets	2,077,362,278	2,085,325,748	2,335,302,726	2,335,302,726
3	Rate of return: 1 ÷ 2	4.74%	6.63%	6.82%	7.16%
4	Assumed rate of return	7.25%	7.25%	7.25%	7.25%
5	Expected investment income: 2 x 4	150,608,765	151,186,117	169,309,448	169,309,448
6	Actuarial gain/(loss): 1 – 5	-$52,151,589	-$12,998,539	-$9,954,337	-$1,990,867

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 ten years, including averages over select time periods.

INVESTMENT RETURN – ACTUARIAL VALUE VS. MARKET VALUE: 2008 - 2017

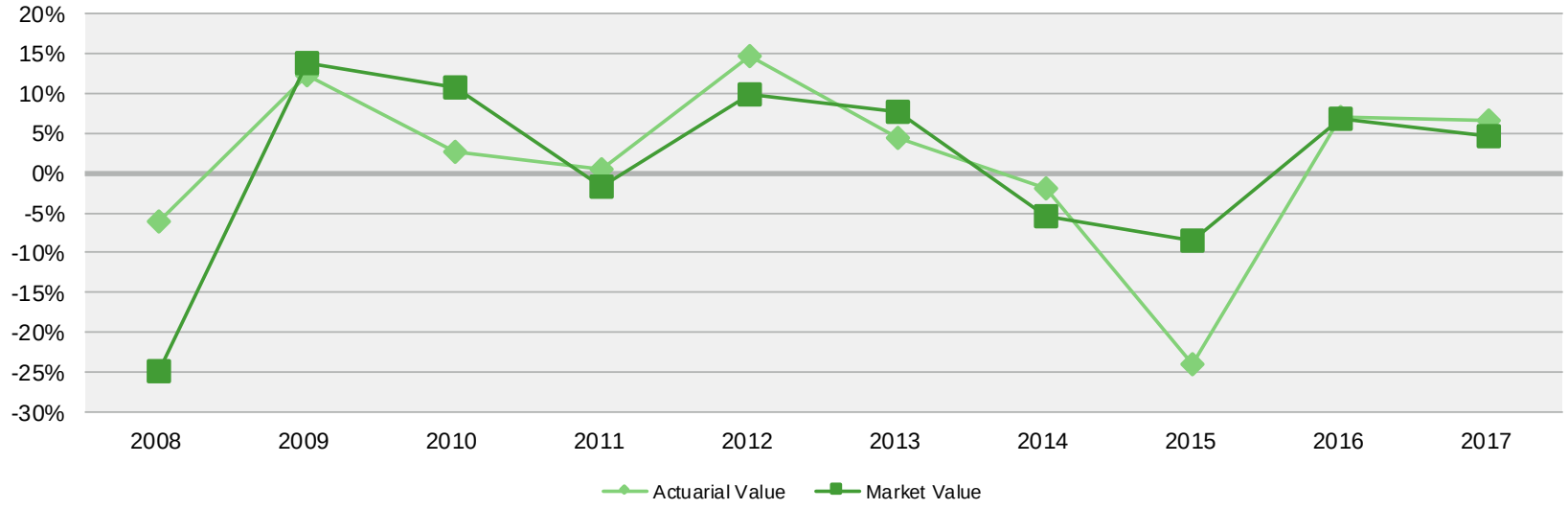
	Actuarial Value Investment Return		Market Value Investment Return	
Year Ended December 31	Amount[1]	Percent	Amount[2]	Percent
2008	-$199,538,242	-6.14%	-$838,497,127	-24.80%
2009	371,704,709	12.29	347,054,071	13.78
2010	90,332,398	2.69	303,461,949	10.72
2011	14,561,313	0.43	-54,844,275	-1.78
2012	493,841,725	14.79	292,719,981	9.92
2013	169,425,156	4.52	243,514,011	7.70
2014	-75,632,075	-1.98	-176,940,296	-5.35
2015	-1,406,733,309	-24.03	-254,829,470	-8.47
2016	167,318,581	7.16	159,355,111	6.82
2017	138,187,578	6.63	98,457,176	4.74
Total	-$236,532,166		$119,451,131	
Most recent five-year average return		-6.70%		0.50%
Most recent ten-year average return		-0.79%		0.42%

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

[1]Includes a change in asset method for plan years 2012 and 2015
[2]Return for years 2014 and 2015 include significant write-downs of the Plan's assets

As described earlier in this section, the actuarial asset valuation method gradually recognizes fluctuations in the market value rate of return.

MARKET AND ACTUARIAL RATES OF RETURN FOR YEARS ENDED DECEMBER 31, 2008 - 2017



Administrative Expenses

Administrative expenses for the year ended December 31, 2017 totaled $8,089,584 compared to the assumption of $10,000,000, payable monthly. This resulted in a gain of $1,978,457 for the year, when adjusted for timing. Because it is expected that these expenses will continue at this level, we have changed the assumption from $10,000,000 to $8,500,000, payable monthly, for the current year.

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),
- mortality (more or fewer deaths than projected),
- the number of disability retirements (more or fewer than projected), and
- salary increases (greater or smaller than projected).

The net loss from this other experience for the year ended December 31, 2017 amounted to $53,684,435, which is 1.2% of the actuarial accrued liability. The majority of this is the result of retirement experience.

Changes in the Actuarial Accrued Liability

The actuarial accrued liability as of January 1, 2018 is $4,505,437,185, an increase of $138,256,731, or 3.2%, from the actuarial accrued liability as of the prior valuation date. The liability is expected to grow each year with normal cost and interest, and to decline due to benefit payments made. Additional fluctuations can occur due to actual experience that differs from expected (as discussed in the previous subsection).

Actuarial Assumptions

The assumption changes reflected in this report are:

- The DROP account interest rate assumption for the annuitization of September 1, 2017 DROP balances was increased from 2.75% to 3.00%.
- The COLA is assumed to begin October 1, 2053 based on the year the System is projected to be 70% funded on a market value basis; last year's assumption was that the COLA would begin October 1, 2049.
- Administrative expenses decreased from $10,000,000 to $8,500,000, or 1% of computation pay if greater, for the year beginning January 1, 2018.
- These changes decreased the actuarial accrued liability by 0.20% and decreased the normal cost by 1.47%.
- Details on actuarial assumptions and methods are in *Section 4, Exhibit I*.

Plan Provisions

The plan change reflected in this report is:

- Members who entered DROP before June 1, 2017 were allowed to revoke the DROP election during the period from September 1, 2017 through February 28, 2018. The valuation reflects these DROP revocations.
- This change increased the actuarial accrued liability by 0.46% and increased the normal cost by 0.66%.
- A summary of plan provisions is in *Section 4, Exhibit II*.

Development of Unfunded Actuarial Accrued Liability

DEVELOPMENT FOR YEAR ENDED DECEMBER 31, 2017

1	Unfunded actuarial accrued liability at beginning of year		$2,209,380,724
2	Normal cost at beginning of year		68,422,682
3	Total contributions		-159,295,430
4	Interest		
	• For whole year on 1 + 2	$165,140,747	
	• For half year on 3	-5,706,869	
	Total interest		159,433,878
5	Expected unfunded actuarial accrued liability		$2,277,941,854
6	Changes due to:		
	• Net experience loss	$64,704,517	
	• Plan provisions	20,584,848	
	• Assumptions	-8,833,377	
	Total changes		$76,455,988
7	Unfunded actuarial accrued liability at end of year		$2,354,397,842

Actuarially Determined Contribution

The actuarially determined contribution is equal to the employer normal cost payment and a payment on the unfunded actuarial accrued liability. As of January 1, 2018, the actuarially determined contribution is $157,100,128, or 45.40% of computation pay.

Texas Code Section 802.101 requires the actuarial valuations of public retirement systems to include a recommended contribution rate based on an amortization period that does not exceed 30 years. On this basis, the actuarially determined employer contribution is 45.40% of computation pay. Under the provisions of HB 3158, the City contributes mandated biweekly amounts through 2024 (but no less than 34.50% of computation pay), plus $13 million per year. Beginning January 1, 2025, the City will contribute 34.50% of computation pay. The effective amortization period, based on the City's payroll projections, is 45 years.

The contribution requirement as of January 1, 2018 are 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.

ACTUARIALLY DETERMINED CONTRIBUTION FOR YEAR BEGINNING JANUARY 1

		2018		2017	
		Amount	% of Total Computation Pay	Amount	% of Total Computation Pay
1.	Total normal cost	$53,684,776	15.52%	$58,766,591	16.44%
2.	Assumed administrative expenses	8,207,677	2.37%	9,656,091	2.70%
3.	Expected member contributions	-46,714,953	-13.50%	-33,475,626	-9.36%
4.	Employer normal cost: (1) + (2) - (3)	$15,177,500	4.39%	$34,947,056	9.78%
5.	Actuarial accrued liability	$4,505,437,185		$4,367,180,454	
6.	Actuarial value of assets	2,151,039,343		2,157,799,730	
7.	Unfunded actuarial accrued liability: (5) - (6)	$2,354,397,842		$2,209,380,724	
8.	Payment on unfunded actuarial accrued liability, 30-year amortization	136,519,813	39.45%	128,110,992	35.84%
9.	Adjustment for timing[1]	5,402,815	1.56%	5,807,436	1.63%
10.	Actuarially determined employer contribution: (4) + (8) + (9)	$157,100,128	45.40%	$168,865,484	47.25%
11.	Total computation pay	$346,036,690		$357,414,472	

[1]Actuarially determined contributions are assumed to be paid at the middle of every year.

Reconciliation of Actuarially Determined Contribution

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

RECONCILIATION OF ACTUARIALLY DETERMINED CONTRIBUTION FROM JANUARY 1, 2017 TO JANUARY 1, 2018

	Amount
Actuarially Determined Contribution as of January 1, 2017	$168,865,484
• Effect of expected change in amortization payment due to payroll growth	3,648,528
• Effect of contributions less than actuarially determined contribution	2,795,874
• Effect of DROP revocations	1,608,171
• Effect of investment loss	793,845
• Effect of maintaining 30-year amortization period	-2,393,398
• Effect of change in administrative expense assumption	-1,500,000
• Effect of other changes in actuarial assumptions	-1,357,915
• Effect of other gains and losses on accrued liability	3,157,781
• Net effect of other changes, including composition and number of participants	-18,518,242
Total change	-$11,765,356
Actuarially Determined Contribution as of January 1, 2018	$157,100,128

History of Employer Contributions

A history of the most recent years of contributions is shown below.

HISTORY OF EMPLOYER CONTRIBUTIONS: 2016 – 2018

Fiscal Year Ended December 31	Actuarially Determined Employer Contribution (ADEC)		Actual Employer Contribution		Percent Contributed
	Amount	Percentage of Covered Compensation	Amount	Percentage of Covered Compensation	
2016	$261,859,079	71.70%	$119,423,106	32.70%	45.61%
2017	168,865,484	47.25%	126,318,005	35.34%	74.80%
2018	157,100,128	45.40%	N/A	N/A	N/A

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 System. Upon request, a more detailed assessment of the risks can be provided to enable a better understanding of the risks specific to your Plan.

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

  The System has experienced first-hand some of the challenges associated with investment risk, and has had to write down the value of its assets significantly in recent years. Recognized market returns have been well below the long-term assumption as the System rebalances the investment portfolio, and are expected to continue to be below average in the short-term.

  The market value rate of return over the last ten years has ranged from a low of -24.80% to a high of 13.78%

- **Contribution Risk** (the risk that actual contributions will be different from expected)

  Plan contributions are set by statute. Periodic projections are prepared by the actuary to determine if expected statutory contributions are sufficient to fund the System and ensure the payment of promised benefits.

  Although State law establishes minimums on the City contributions through 2024, the contribution is scheduled to be a flat 34.50% of computation pay beginning in 2025. If the payroll growth matches the City's Hiring Plan projections, and if all other assumptions are met, the System should be fully funded by 2063. The City's plan reflects significant growth in payroll over 20 years, from $372 million in 2017 to $684 million in 2037. The annual average growth in this plan is 3.09%, compared to the valuations assumption of 2.75%. If payroll growth is more modest, or if there is adverse experience in the System that leads to losses, the period required to achieve 100% funding could be significantly longer.

  Through the first two years of the policy (2017 and 2018), valuation payroll based on participant data is cumulatively $32.5 million less than the City's projections. If the City's Hiring Plan projections are not met and instead the current valuation payroll of $346.0 million increases by the assumed payroll growth of 2.75% each year ongoing, and if City and member contributions are based on this projected payroll beginning in 2025, the System is projected to be only 33% funded in 2063, rather than 100% funded.

- **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 actuarially determined contribution.

- **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 System's actual experience. Over the past ten years:

  - The annual investment experience has ranged from a loss of $1.1 billion (including write-downs) to a gain of $0.1 billion. If all investment returns had equaled the assumed rates of return over the last ten years, the market value of assets as of December 31, 2017 would be approximately $3.8 billion as opposed to the actual value of $2.1 billion.
  - The funded percentage on the actuarial value of assets has ranged from a high of 81.9% to a low of 45.1% since 2009.

- **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 1.00. For the prior year benefits paid were $136.9 million more than contributions received. As the Plan matures, more cash will be needed from the investment portfolio to meet benefit payments.

GFOA Solvency Test

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 member 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. As noted previously, the funding policy adopted by the State in HB 3158 meets this standard, with full funding in 2063, if the City's Hiring Plan payroll projections come to fruition. City and member contributions, as well as investment returns, will be necessary to increase the assets sufficiently to cover the System's liabilities.

GFOA SOLVENCY TEST AS OF DECEMBER 31

	2018	2017
Actuarial accrued liability (AAL)		
• Active member contributions	$280,965,388	$284,870,633
• Retirees and beneficiaries	2,989,814,931	2,707,966,011
• Active and inactive members (employer-financed)	1,234,656,866	1,374,343,810
Total	$4,505,437,185	$4,367,180,454
Actuarial value of assets	$2,151,039,343	$2,157,799,730
Cumulative portion of AAL covered		
• Active member contributions	100.00%	100.00%
• Retirees and beneficiaries	62.55%	69.16%
• Active and inactive members (employer-financed)	0.00%	0.00%

Actuarial Balance Sheet

An overview of the Plan's funding is given by an Actuarial Balance Sheet. In this approach, first the amount and timing of all future payments that will be made by the Plan for current participants is determined. Then these payments are discounted at the valuation interest rate to the date of the valuation, thereby determining the present value, referred to as the "liability" of the Plan.

Second, this liability is compared to the assets. The "assets" for this purpose include the net amount of assets already accumulated by the Plan, the present value of future member contributions, the present value of future employer normal cost contributions, and the present value of future employer amortization payments for the unfunded actuarial accrued liability.

ACTUARIAL BALANCE SHEET

	Year Ended	
	December 31, 2017	December 31, 2016
Liabilities		
• Present value of benefits for retired members and beneficiaries (non-DROP)	$2,180,228,938	$2,010,892,885
• Present value of benefits for retired members and beneficiaries (DROP)	809,585,993	697,073,126
• Present value of benefits for inactive vested members	28,394,650	26,871,346
• Present value of benefits for active members	1,972,348,070	2,124,349,682
Total liabilities	**$4,990,557,651**	**$4,859,187,039**
Assets		
• Total valuation value of assets	$2,151,039,343	$2,157,799,730
• Present value of future contributions by members	416,859,565	394,435,090
• Present value of future employer contributions for:		
» Entry age cost	68,260,901	97,571,495
» Unfunded actuarial accrued liability	2,354,397,842	2,209,380,724
Total of current and future assets	**$4,990,557,651**	**$4,859,187,039**

Section 3: Supplemental Information

EXHIBIT A – TABLE OF PLAN COVERAGE

Category	Year Ended December 31 2017	2016	Change From Prior Year
Total active members in valuation:			
• Number	4,952	5,104	-3.0%
• Average age	40.6	41.4	-0.8
• Average years of service	13.4	14.3	-0.9
• Total computation pay	$346,036,690	$357,414,472	-3.2%
• Average computation pay	69,878	70,026	-0.2%
• Accumulated contribution balances	280,965,388	284,870,633	-1.4%
• Total active vested members	3,757	3,978	-5.6%
Active members (excluding DROP):			
• Number	4,326	4,002	8.1%
• Average age	38.3	37.6	0.7
• Average years of service	11.0	10.3	0.7
• Total computation pay	$292,533,861	$262,030,358	11.6%
• Average computation pay	67,622	65,475	3.3%
Active members (DROP only):			
• Number	626	1,102	-43.2%
• Average age	56.1	55.1	1.0
• Average years of service	29.7	28.3	1.4
• Total computation pay	$53,502,829	$95,384,114	-43.9%
• Average computation pay	85,468	86,555	-1.3%
• DROP account balances	241,364,638	356,421,938	-32.3%
Inactive vested members:			
• Number	226	215	5.1%
• Average age	39.8	39.4	0.4%
• Average monthly benefit	$1,164	$1,125	3.5%
Terminated members due a refund of contributions:			
• Number	399	295	35.3%
• Accumulated contribution balance	$1,008,098	$1,170,846	-13.9%

Category	Year Ended December 31		Change From Prior Year
	2017	2016	
Retired members:			
• Number in pay status	3,455	3,189	8.3%
• Average age	67.1	67.6	-0.5
• Average monthly benefit	$4,831	$4,793	0.8%
Disabled members:			
• Number in pay status	143	149	-4.0%
• Average age	66.8	67.2	-0.4
• Average monthly benefit	$3,570	$3,550	0.6%
Beneficiaries:			
• Number in pay status	1,108	1,077	2.9%
• Average age	72.5	72.2	0.3
• Average monthly benefit	$2,191	$2,126	3.1%
Beneficiaries with DROP only:			
• Number	42	41	2.4%

EXHIBIT B-1 – TOTAL MEMBERS IN ACTIVE SERVICE AS OF DECEMBER 31, 2017 BY AGE, YEARS OF SERVICE, AND AVERAGE COVERED COMPENSATION

	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	200	200	- -	- -	- -	- -	- -	- -	- -	- -
	$48,612	$48,612	- -	- -	- -	- -	- -	- -	- -	- -
25 - 29	590	486	104	- -	- -	- -	- -	- -	- -	- -
	53,893	52,519	$60,310	- -	- -	- -	- -	- -	- -	- -
30 - 34	913	318	473	122	- -	- -	- -	- -	- -	- -
	59,784	53,021	62,695	$66,124	- -	- -	- -	- -	- -	- -
35 - 39	789	126	269	308	86	- -	- -	- -	- -	- -
	65,185	53,241	62,526	68,799	$78,056	- -	- -	- -	- -	- -
40 - 44	730	34	132	193	315	56	- -	- -	- -	- -
	74,091	53,180	61,746	70,513	81,265	$87,867	- -	- -	- -	- -
45 - 49	716	15	45	95	214	235	112	- -	- -	- -
	81,615	53,045	62,178	70,806	81,354	88,315	$88,862	- -	- -	- -
50 - 54	588	4	15	30	58	108	274	99	- -	- -
	84,738	58,242	62,629	73,476	79,533	86,495	86,916	$87,672	- -	- -
55 - 59	345	2	3	19	22	21	105	139	34	- -
	84,512	41,174	61,833	71,467	78,834	82,320	84,939	87,626	$87,330	- -
60 - 64	59	- -	3	3	1	5	12	20	11	4
	85,132	- -	73,406	71,635	73,160	92,587	83,907	85,254	89,227	$89,534
65 - 69	18	- -	- -	3	- -	- -	3	3	2	7
	86,134	- -	- -	68,389	- -	- -	92,479	85,442	82,956	92,224
70 & over	4	- -	- -	- -	- -	- -	1	- -	- -	3
	106,307	- -	- -	- -	- -	- -	94,547	- -	- -	110,227
Total	4,952	1,185	1,044	773	696	425	507	261	47	14
	$69,878	$52,097	$62,299	$69,308	$80,663	$87,547	$86,914	$87,437	$87,588	$95,313

EXHIBIT B-2 – POLICE MEMBERS IN ACTIVE SERVICE AS OF DECEMBER 31, 2017 BY AGE, YEARS OF SERVICE, AND AVERAGE PAYROLL

	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	131	131	- -	- -	- -	- -	- -	- -	- -	- -
	$48,492	$48,492	- -	- -	- -	- -	- -	- -	- -	- -
25 - 29	366	300	66	- -	- -	- -	- -	- -	- -	- -
	53,783	52,617	$59,081	- -	- -	- -	- -	- -	- -	- -
30 - 34	538	168	279	91	- -	- -	- -	- -	- -	- -
	59,995	53,112	61,794	$67,186	- -	- -	- -	- -	- -	- -
35 - 39	478	53	151	213	61	- -	- -	- -	- -	- -
	66,036	51,804	62,302	69,100	$76,942	- -	- -	- -	- -	- -
40 - 44	435	26	73	113	186	37	- -	- -	- -	- -
	72,863	53,547	60,687	70,184	79,058	$87,497	- -	- -	- -	- -
45 - 49	492	12	43	66	124	151	96	- -	- -	- -
	80,400	52,752	62,142	71,328	79,063	87,846	$88,287	- -	- -	- -
50 - 54	393	1	15	19	35	67	212	44	- -	- -
	84,116	59,514	62,629	72,661	78,220	86,359	86,498	$86,743	- -	- -
55 - 59	198	- -	3	10	19	13	76	58	19	- -
	84,419	- -	61,833	71,798	78,675	84,862	84,439	88,566	$87,333	- -
60 - 64	26	- -	3	2	1	3	8	5	2	2
	84,844	- -	73,406	74,025	73,160	85,891	86,233	87,089	97,941	$92,821
65 - 69	9	- -	- -	2	- -	- -	1	2	1	3
	83,258	- -	- -	69,175	- -	- -	100,829	89,231	82,654	83,009
70 & over	2	- -	- -	- -	- -	- -	1	- -	- -	1
	102,774	- -	- -	- -	- -	- -	94,547	- -	- -	111,001
Total	3,068	691	633	516	426	271	394	109	22	6
	$69,773	$51,940	$61,603	$69,488	$78,657	$87,266	$86,588	$87,775	$88,084	$90,945

EXHIBIT B-3– FIRE MEMBERS IN ACTIVE SERVICE AS OF DECEMBER 31, 2017 BY AGE, YEARS OF SERVICE, AND AVERAGE PAYROLL

	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	69	69	- -	- -	- -	- -	- -	- -	- -	- -
	$48,839	$48,839	- -	- -	- -	- -	- -	- -	- -	- -
25 - 29	224	186	38	- -	- -	- -	- -	- -	- -	- -
	54,072	52,362	$62,443	- -	- -	- -	- -	- -	- -	- -
30 - 34	375	150	194	31	- -	- -	- -	- -	- -	- -
	59,481	52,920	63,992	$63,005	- -	- -	- -	- -	- -	- -
35 - 39	311	73	118	95	25	- -	- -	- -	- -	- -
	63,878	54,284	62,813	68,126	$80,773	- -	- -	- -	- -	- -
40 - 44	295	8	59	80	129	19	- -	- -	- -	- -
	75,903	51,989	63,058	70,977	84,448	$88,588	- -	- -	- -	- -
45 - 49	224	3	2	29	90	84	16	- -	- -	- -
	84,284	54,216	62,955	69,617	84,510	89,157	$92,312	- -	- -	- -
50 - 54	195	3	- -	11	23	41	62	55	- -	- -
	85,991	57,817	- -	74,885	81,532	86,715	88,349	$88,415	- -	- -
55 - 59	147	2	- -	9	3	8	29	81	15	- -
	84,637	41,174	- -	71,099	79,840	78,191	86,251	86,952	$87,328	- -
60 - 64	33	- -	- -	1	- -	2	4	15	9	2
	85,360	- -	- -	66,857	- -	102,632	79,254	84,643	87,291	$86,247
65 - 69	9	- -	- -	1	- -	- -	2	1	1	4
	89,010	- -	- -	66,819	- -	- -	88,305	77,864	83,258	99,135
70 & over	2	- -	- -	- -	- -	- -	- -	- -	- -	2
	109,840	- -	- -	- -	- -	- -	- -	- -	- -	109,840
Total	1,884	494	411	257	270	154	113	152	25	8
	$70,049	$52,316	$63,371	$68,947	$83,829	$88,042	$88,049	$87,194	$87,152	$98,589

EXHIBIT C – RECONCILIATION OF MEMBER DATA

	Active Members	Inactive Vested Members[1]	Disableds	Retired Members	Beneficiaries[2]	Total
Number as of January 1, 2017	**5,104**	**215**	**149**	**3,189**	**1,077**	**9,734**
• New members	376	N/A	N/A	N/A	N/A	376
• Terminations – with vested rights	-48	48	0	0	0	0
• Terminations – without vested rights	-45	N/A	N/A	N/A	N/A	-45
• Retirements	-350	-7	N/A	357	N/A	0
• New disabilities	-3	0	3	N/A	N/A	0
• Return to work	7	-2	0	0	N/A	5
• Deceased	-5	0	-9	-91	-41	-146
• New beneficiaries	0	0	0	0	83	83
• Lump sum pay outs[3]	-84	-28	0	0	0	-112
• Certain period expired	N/A	N/A	0	0	-11	-11
Number as of January 1, 2018	**4,952**	**226**	**143**	**3,455**	**1,108**	**9,884**

[1]Excludes terminated members due a refund of contributions
[2]Excludes beneficiaries with a DROP only
[3]Members who terminated and requested a refund of member contributions

EXHIBIT D – SUMMARY STATEMENT OF INCOME AND EXPENSES ON A MARKET VALUE BASIS

	Year Ended December 31, 2017		Year Ended December 31, 2016	
Net assets at market value at the beginning of the year[1, 3]		**$2,149,836,260**		**$2,680,124,303**
Contribution income:				
• Employer contributions	$126,318,005		$119,423,106	
• Member contributions	32,977,425		25,518,317	
• Less administrative expenses	-8,089,584		-9,492,445	
Net contribution income		*$151,205,846*		*$135,448,978*
Investment income:				
• Interest, dividends and other income	$33,099,632		$54,956,120	
• Recognition of capital appreciation	74,836,102		120,614,404	
• Less interest expense	-1,279,517		-4,532,196	
• Adjustment to beginning of year value[2]	825,543		0	
• Less investment fees	-9,024,584		-11,683,217	
Net investment income		*$98,457,176*		*$159,355,111*
Total income available for benefits		**$249,663,022**		**$294,804,089**
Less benefit payments:				
• Benefit payments	-$292,576,281		-$821,737,799	
• Refunds	-3,577,530		-3,354,333	
Net benefit payments		*-$296,153,811*		*-$825,092,132*
Change in market value of assets		**-$46,490,789**		**-$530,288,043**
Net assets at market value at the end of the year[1, 3]		**$2,103,345,471**		**$2,149,836,260**

[1]Based on preliminary unaudited assets

[2]Adjustment from draft financial statement used in the prior valuation to the final audited statements

[3]Unaudited assets were used for the January 1, 2017 actuarial valuation. When the audited financial statements were completed, there were updates to the employer contribution and investment return amounts, resulting in a revision to the market value of assets. Thus, the amounts shown above as of December 31, 2016 differ from the System's and City's Comprehensive Annual Financial Reports. The differences are immaterial to the System's actuarial results.

EXHIBIT E – SUMMARY STATEMENT OF PLAN ASSETS

	December 31, 2017	December 31, 2016
Cash equivalents and prepaid expenses	$118,022,612	$324,575,667
Invested securities lending collateral	12,050,625	21,494,665
Capital assets	12,608,396	11,943,266
Total accounts receivable	$34,359,460	$29,150,640
Investments:		
• Real assets	$794,476,173	$1,119,263,244
• Equity securities	466,132,328	153,397,855
• Fixed income securities	325,258,334	267,687,478
• Private equity	220,240,515	262,289,952
• Alternative investments	143,709,605	133,798,219
• Other	24,064,096	6,811,004
Total investments at market value	$1,973,881,051	$1,943,247,752
Total assets	$2,150,922,144	$2,330,411,990
Total accounts payable	-47,576,673	-180,575,730
Net assets at market value[1]	**$2,103,345,471**	**$2,149,836,260**
Net assets at actuarial value	**$2,151,039,343**	**$2,157,799,730**

[1]Unaudited assets were used for the January 1, 2017 actuarial valuation. When the audited financial statements were completed, there were updates to the employer contribution and investment return amounts, resulting in a revision to the market value of assets. Thus, the amounts shown above as of December 31, 2016 differ from the System's and City's Comprehensive Annual Financial Reports. The differences are immaterial to the System's actuarial results.

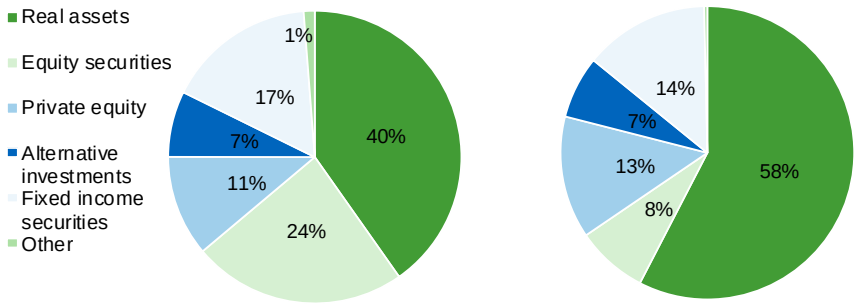


EXHIBIT F – DEVELOPMENT OF THE FUND THROUGH DECEMBER 31, 2017

Year Ended December 31	Employer Contributions	Member Contributions	Net Investment Return[1]	Admin. Expenses[2]	Benefit Payments and Refunds	Market Value of Assets at Year-End	Actuarial Value of Assets at Year-End	Actuarial Value as a Percent of Market Value
2008	$104,372,723	$18,638,767	-$838,497,127	$0	$142,433,301	$2,533,055,971	$3,039,667,165	120.0%
2009	107,699,648	19,584,241	347,054,071	0	155,747,987	2,851,645,944	3,382,907,776	118.6%
2010	108,060,956	19,790,189	303,461,949	0	170,272,496	3,112,686,542	3,430,818,823	110.2%
2011	102,437,115	19,493,460	-54,844,275	0	188,829,489	2,990,943,353	3,378,481,222	113.0%
2012	103,310,264	22,490,884	292,719,981	0	203,099,511	3,206,364,971	3,795,024,584	118.4%
2013	105,711,435	26,044,579	243,514,011	0	218,884,493	3,362,750,503	3,877,321,261	115.3%
2014	109,791,512	28,969,429	-176,940,296	0	245,176,251	3,079,394,897	3,695,273,876	120.0%
2015	114,885,723	25,676,327	-254,829,470	0	285,003,174	2,680,124,303	2,680,124,303	100.0%
2016	119,423,106[3]	25,518,317	159,355,111[3]	9,492,445	825,092,132	2,149,836,260[3]	2,157,799,730	100.4%
2017	126,318,005	32,977,425	98,457,176	8,089,584	296,153,811	2,103,345,471	2,151,039,343	102.3%

[1]On a market basis, net of investment fees

[2]Administrative expenses were subtracted from net investment return prior to the 2016 valuation

[3]Unaudited assets were used for the January 1, 2017 actuarial valuation. When the audited financial statements were completed, there were updates to the employer contribution and investment return amounts, resulting in a revision to the market value of assets. Thus, the amounts shown above as of December 31, 2016 differ from the System's and City's Comprehensive Annual Financial Reports. The differences are immaterial to the System's actuarial results.

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 actuarially determined 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.

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.

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.
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.

Section 4: Actuarial Valuation Basis

EXHIBIT I – ACTUARIAL ASSUMPTIONS AND ACTUARIAL COST METHOD

Rationale for Assumptions:

The information and analysis used in selecting each assumption that has a significant effect on this actuarial valuation is shown in the Experience Study Report for the five-year period ended December 31, 2014, with subsequent changes related to the plan changes and modifications based on the Meet and Confer Agreement.

Net Investment Return:

7.25%

The net investment return assumption was chosen by the Pension System's Board of Trustees, with input from the actuary. This 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 System's target asset allocation.

Salary Scale:

For 2018-2019

2018 – 5% if less than 10 years, 2% if more than 10 years

2019 – 10% if less than 10 years, 7% if 10 – 11 years, 2% if more than 11 years

For 2020 and After

Years of Service	Rate (%)	
	Police	Fire
1	5.20	5.20
2	5.00	5.05
3	4.80	4.90
4	4.60	4.75
5	4.40	4.60
6	4.20	4.45
7	4.00	4.30
8	3.80	4.15
9	3.60	4.00
10	3.40	3.85
11	3.20	3.70
12	3.00	3.55
13	3.00	3.40
14	3.00	3.25
15	3.00	3.10
16 & over	3.00	3.00

Rates above include allowance for inflation of 2.75% per year.

The salary scale assumption is based on the City's pay plan, along with analysis completed in conjunction with an Experience Study Report for the five-year period ended December 31, 2014. The salary scale for 2018-2019 is based on the Meet and Confer Agreement.

Payroll Growth:

2.75%, used to amortize the unfunded actuarial accrued liability as a level percentage of payroll.

Cost-of-Living Adjustments:	
Prior to October 1, 2053	0.00%
Beginning October 1, 2053	2.00%, on original benefit The assumption for the year the COLA begins will be updated on an annual basis and set equal to the year the System is projected to be 70% funded on a market value basis after the COLA is reflected.
Funding Projections:	
Payroll Growth	For purposes of projecting the System's funded status in order to determine when the System will reach 70% funded on a market value basis (and therefore meet COLA requirements), City contributions beginning January 1, 2025 are assumed to be 34.50% of the City's Hiring Plan projections. Beginning in 2038, after the end of the City's Hiring Plan projections, payroll is assumed to increase by 2.75%.
Market Value Asset Returns	4.75% in 2018, 5.00% in 2019, 5.25% in 2020, 6.25% in 2021, and 7.25% annually thereafter
Administrative Expenses:	$8,500,000 per year, payable monthly (equivalent to $8,207,677 at the beginning of the year) or 1% of computation pay, if greater

City's Hiring Plan Payroll Projections (in millions)

Year	Payroll	Year	Payroll
2018	$364	2028	$525
2019	$383	2029	$545
2020	$396	2030	$565
2021	$408	2031	$581
2022	$422	2032	$597
2023	$438	2033	$614
2024	$454	2034	$631
2025	$471	2035	$648
2026	$488	2036	$666
2027	$507	2037	$684

Mortality Rates:

Pre-retirement: RP-2014 Employee Mortality Table, set back two years for males, projected generationally using Scale MP-2015

Healthy annuitants: RP-2014 Blue Collar Healthy Annuitant Mortality Table, set forward two years for females, projected generationally using Scale MP-2015

Disabled annuitants: RP-2014 Disabled Retiree Mortality Table, set back three years for males and females, projected generationally using Scale MP-2015

The tables above, with adjustments as shown, reasonably reflect the mortality experience of the System as of the measurement date. The mortality tables were then generationally projected using Scale MP-2015 to anticipate future mortality improvement.

Mortality and Disability Rates Before Retirement:

	Rate (%)			
	Mortality[1]		Disability[2]	
Age	Male	Female	Male	Female
20	0.03	0.02	0.010	0.010
25	0.05	0.02	0.015	0.015
30	0.04	0.02	0.020	0.020
35	0.05	0.03	0.025	0.025
40	0.06	0.04	0.030	0.030
45	0.08	0.07	0.035	0.035
50	0.14	0.11	0.040	0.040
55	0.23	0.17	--	--
60	0.38	0.24	--	--
65	1.26	1.05	--	--
70	1.97	1.70	--	--
75	3.15	2.81	--	--
80	5.19	4.71	--	--

[1]Rates shown do not include generational projection; rates beginning at age 65 are for healthy annuitants

[2]100% of disabilities are assumed to be service-related

Withdrawal Rates Before Retirement:

Years of Service	Rate (%)	
	Police	Fire
0	14.00	5.50
1	6.00	4.50
2	5.50	4.00
3	5.00	3.50
4	4.50	3.00
5	4.00	1.50
6	3.50	1.00
7	3.00	0.75
8	2.50	0.50
9	2.00	0.50
10-37	1.00	0.50
38 & over	0.00	0.00

Retirement Rates:

DROP Active Members

Police	
Age	Rate (%)
Under 50	1.00
50-52	3.00
53-54	7.00
55	15.00
56-57	20.00
58-64	25.00
65-66	50.00
67	100.00

Fire	
Age	Rate (%)
Under 50	0.75
50-54	2.50
55-58	12.00
59-64	25.00
65-66	30.00
67	100.00

If at least eight years in DROP as of January 1, 2017, 100% retirement rate in 2018
If less than eight years in DROP as of January 1, 2017, 50% retirement rate in 2018

Retirement Rates (continued):

Non-DROP Active Members

Members hired prior to March 1, 2011 with less than 20 years of service as of September 1, 2017		Members hired prior to March 1, 2011 with at least 20 years of service as of September 1, 2017		Members hired on or after March 1, 2011	
Age	Rate (%)	Age	Rate (%)	Age	Rate (%)
Under 50	0	Under 50	1	Under 50	1
50	10	50	20	50	5
51	5	51	10	51	5
52	5	52	10	52	5
53	5	53	10	53	5
54	5	54	20	54	10
55	15	55	40	55	20
56	10	56	50	56	30
57	5	57	50	57	40
58	60	58	60	58	50
59	50	59	60	59	50
60	50	60	60	60	50
61	50	61	60	61	50
62 & over	100	62 & over	100	62 & over	100

100% retirement rate once the sum of age plus service equals 90

Weighted Average Retirement Age:

Age 56, 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, 2018 actuarial valuation.

Retirement Rates for Inactive Vested Participants:

Current terminated vested members are assumed to retire at age 50

Future terminated vested members are assumed to retire at age 58

Interest on DROP Accounts:	3.00% on account balances as of September 1, 2017, payable upon retirement 0.0% on account balances accrued after September 1, 2017
DROP Utilization:	0% of Police and Fire members are assumed to elect to enter the DROP
DROP Payment Period:	Based on expected lifetime as of the later of September 1, 2017 or retirement date. Expected lifetime determined based on an 85%/15% male/female blend of the current healthy annuitant mortality tables.
DROP Annuitization Interest:	3.00%. Based on United States Department of Commerce Daily Treasury Yield Curve Rates for durations between 5 and 30 years.
Unknown Data for Participants:	Same age and service as those exhibited by members with similar known characteristics. If not specified, members are assumed to be male.
Family Composition:	75% of participants are assumed to be married. Females are assumed to be three years younger than males. The youngest child is assumed to be ten years old.
Benefit Election:	Married participants are assumed to elect the Joint and Survivor annuity form of payment and non-married participants are assumed to elect a Life Only annuity.
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 Normal Actuarial Cost Method. Entry Age is the age at the time the member commenced employment. Normal Cost and Actuarial Accrued Liability are calculated on an individual basis, with Normal Cost determined as if the current benefit accrual rate had always been in effect. Actuarial Liability is allocated by salary.
Amortization Methodology:	The actuarially determined contribution is calculated using a 30-year amortization of unfunded actuarially accrued liability.
Justification for Changes in Actuarial Assumptions:	The following assumptions were updated with this valuation: ➢ The administrative expense assumption was changed from the greater of $10 million per year or 1% of computation pay to $8.5 million per year or 1% of computation pay. ➢ Interest payable upon retirement on DROP account balances as of September 1, 2017 increased from 2.75% to 3.00%. ➢ Annual 2.00% COLAs are assumed to be payable beginning October 1, 2053, based on an updated projection of unfunded actuarial accrued liability. In the prior valuation these COLAs were assumed to begin October 1, 2049.

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.

MEMBERS WHOSE PARTICIPATION BEGAN BEFORE MARCH 1, 2011

Plan Year:	January 1 through December 31
Plan Status:	Ongoing
Normal Retirement:	
Benefit Earned Prior to September 1, 2017	
Age Requirement	50
Service Requirement	5
Amount	Greater of 3.0% of Average Computation Pay times years of Pension Service (maximum 96.0%) and $2,200 per month. The $2,200 per month minimum benefit is prorated if the Member retires with less than 20 years of service.
Average Computation Pay	36 consecutive months that reflect the highest civil service rank held by a member, plus Educational Incentive Pay, Longevity Pay and City Service Incentive Pay
Benefit Earned Beginning September 1, 2017	
Age Requirement	58
Service Requirement	5
Amount	Greater of 2.5% of Average Computation Pay times years of Pension Service (maximum 90.0%) and $2,200 per month. The $2,200 per month minimum benefit is prorated if the Member retires with less than 20 years of service.
Average Computation Pay	60 consecutive months that reflects the highest civil service rank held by a member, plus Educational Incentive Pay, Longevity Pay and City Service Incentive Pay

20 and Out Reduced Retirement:

If Eligible as of September 1, 2017

Age Requirement: None

Service Requirement: 20 years

Amount: 20 & Out Multiplier times 36-month (Table 1 Benefit) or 60-month (Table 2 Benefit) Average Computation Pay times years of Pension Service

Benefit Accrued Before September 1, 2017 20 & Out Table 1		Benefit Accrued Beginning September 1, 2017 20 & Out Table 2	
Age	20 & Out Multiplier	Age	20 & Out Multiplier
45 & under	2.00%	53 & under	2.00%
46	2.25%	54	2.10%
47	2.50%	55	2.20%
48	2.75%	56	2.30%
49	2.75%	57	2.40%
50 & above	3.00%	58 & above	2.50%

If Not Eligible as of September 1, 2017

Age Requirement: None

Service Requirement: 20 years

Amount: 20 & Out Multiplier times 60-month Average Computation Pay times years of Pension Service

20 & Out Table 2	
Age	20 & Out Multiplier
53 & under	2.00%
54	2.10%
55	2.20%
56	2.30%
57	2.40%
58 & above	2.50%

Early Retirement:	
If at least age 45 as of September 1, 2017 and less than age 50	
Age Requirement	45
Service Requirement	5
Amount	Normal pension accrued prior to September 1, 2017 plus the benefit accrued based on the 20 & Out Table 2 for service beginning September 1, 2017, reduced by 2/3 of 1% for each whole month by which the benefit commencement date precedes age 50.
Non-Service Connected Disability:	
Eligibility	Injury or illness (lasting more than 90 days) not related to or incurred while in the performance of the member's job, preventing the member from performing their departmental duties.
Amount	3% of Average Computation Pay for service earned prior to September 1, 2017 and the applicable benefit multiplier from 20 & Out Table 2 times Average Computation Pay for service earned beginning September 1, 2017
Service Connected Disability:	
Eligibility	Injury or illness (lasting more than 90 days) obtained while on duty in the performance of the member's job.
Amount	3% of Average Computation Pay for service earned prior to September 1, 2017 and the applicable benefit multiplier from 20 & Out Table 2 times Average Computation Pay for service earned beginning September 1, 2017; if the member has less than 20 years of service, the benefit will be calculated as if they had 20 years at the time of disability.
Benefit Supplement:	
Age Requirement	55
Service Requirement	20 years, waived if member is receiving a service-connected disability
Amount	3% of the total monthly benefit (including any applicable COLA's) payable to the Member when the Member attains age 55. The benefit supplement shall not be less than $75 per month. Beginning September 1, 2017, only those annuitants already receiving the supplement will be eligible to maintain their current supplement, which will not change ongoing; no additional retirees will be eligible for the supplement.
Termination Benefit:	
With less than five years of pension service	Upon request, the member's contributions will be returned without interest
With at least five years of pension service	The member may either withdraw contributions or leave contributions in the Plan and receive a monthly benefit to commence no earlier than the member's earliest eligibility for retirement benefits. Retirement benefit is equal to the accrued benefit as of the date of termination.

Pre-Retirement Death Benefit:	
While in active service	The greater of 50% of the Member's accrued benefit or a benefit based on 20 years of service. The benefit may not exceed 45% of Average Computation Pay.
After leaving active service, with fewer than five years	A lump sum benefit equal to the return of member contributions with interest
After leaving active service, with at least five years	50% of the Member's accrued benefit, with no early retirement reduction, or a refund of member contributions
Post-Retirement Death Benefit:	50% of the pension the Member was receiving at the time of their death
Qualified Surviving Children Benefit:	50% of the pension the Member was receiving at the time of their death, divided equally among the children, paid until the youngest child is 19 years old or for life if the child becomes handicapped prior to age 23
Minimum Survivor Benefit:	$1,100 per month, not to exceed the actual amount the Member was receiving upon their death. If there are no Qualified Surviving Children, the minimum benefit to a spouse who is a Qualified Survivor shall be $1,200 per month. If the Member had less than 20 years of Pension Service, the minimum benefit will be prorated based on actual years of Pension Service.
Special Survivor Benefit:	
Eligibility	Upon leaving active service or joining DROP: a) the Member was at least 55 years old with at least 20 years of pension service, or b) the sum of the Member's age plus Pension Service was at least 78; **and** Has no Qualified Surviving Children or handicapped children currently eligible for survivor benefits; **and** Whose Qualified Surviving Spouse is at least 55 years old. The Qualified Surviving Spouse does not have to be 55 years old at the time of the Member's death.
Amount	Once all the eligibility conditions are met, the amount the Qualified Surviving Spouse will receive increases from 50% of the Member's pension benefit to a percentage of the Member's pension benefit based on the Member's applicable benefit multiplier times the number of years of Pension Service the Member worked.
Survivor Benefit if No Qualified Surviving Spouse:	A lump sum that is the actuarial equivalent of 120 monthly payments of the greater of: 50% of the Member's pension benefit at the time of their death, or a benefit based on 20 years of the Member's service.

DROP:	
Eligibility	Members in active service who are retirement eligible may elect to enter the Deferred Retirement Option Plan (DROP).
Distribution	The DROP account balance will be paid over the expected future lifetime of annuitants.
Interest	Based on United States Department of Commerce Daily Treasury Yield Curve Rates for durations between 5 and 30 years; interest rate is based on the expected lifetime of the members at the time they retire.
Cost of Living:	The Board may grant an ad hoc COLA based on the actual market return over the prior five years less 5%, not to exceed 4% of the base benefit, if, after granting a COLA, the funded ratio on a market value of assets basis is no less than 70%.
Member Contributions:	13.5% of computation pay for all members
City Contributions:	The City will contribute 34.5% of computation payroll each year. However, in no case shall the City's total contribution amount be less than: $5,173,000 for the biweekly pay periods beginning with the first biweekly pay period that begins after September 1, 2017 and ends on the last day of the first biweekly pay period that ends after December 31, 2017; $5,344,000 for the following 26 pay periods; $5,571,000 for the following 26 pay periods; $5,724,000 for the following 26 pay periods; $5,882,000 for the following 26 pay periods; $6,043,000 for the following 26 pay periods; $5,812,000 for the following 26 pay periods; and $6,024,000 for the following 26 pay periods. An additional 1/26th of $13 Million will be paid biweekly beginning with the first biweekly pay period that begins after September 1, 2017 and ending with the last biweekly pay period that ends after December 31, 2024.
Optional Forms of Benefits:	Life Annuity with 36 months guaranteed; 50% or 75% Husband-and-Wife Pension with Pop-Up; 66-2/3% or 100% Joint and Survivor Pension.
Changes in Plan Provisions:	Active members who elected to enter DROP prior to June 1, 2017 were eligible to revoke the DROP election during the period September 1, 2017 through February 28, 2018.

MEMBERS WHOSE PARTICIPATION BEGAN ON OR AFTER MARCH 1, 2011

Normal Retirement:	
Age Requirement	58
Service Requirement	5
Amount	2.5% of Average Computation Pay for each year of Pension Service, maximum 90% The minimum monthly benefit is $110 times the number of years of Pension Service at retirement, but not greater than $2,200.
Average Computation Pay	Average Computation Pay uses the 60 consecutive months that reflects the highest civil service rank held by a member plus Educational Incentive Pay plus Longevity Pay plus City Service Incentive Pay.
Early Retirement:	
Age Requirement	53
Service Requirement	5
Amount	Normal pension accrued, reduced by 2/3 of 1% for each whole month by which the benefit commencement date precedes the normal retirement date.
20 and Out Reduced Retirement:	
Age Requirement	None
Service Requirement	20 years
Amount	20 & Out Multiplier times Average Computation Pay times years of Pension Service

20 & Out Table 2	
Age	**20 & Out Multiplier**
53 & under	2.00%
54	2.10%
55	2.20%
56	2.30%
57	2.40%
58 & above	2.50%

Non-Service Connected Disability:	
Eligibility	Injury or illness (lasting more than 90 days) not related to or incurred while in the performance of the member's job, preventing the member from performing their departmental duties.
Amount	The Member's accrued benefit, but not less than a pro-rated minimum benefit.
Service-Connected Disability:	
Eligibility	Injury or illness (lasting more than 90 days) obtained while on duty in the performance of the member's job.
Amount	The greater of 50% of Average Computation Pay and the Member's accrued benefit.
Termination Benefit:	
With less than five years of service	Upon request, the member's contributions will be returned without interest.
With at least five years of service	The member may either withdraw contributions or leave contributions in the Plan and receive a monthly benefit to commence no earlier than the member's earliest eligibility for retirement benefits. Retirement benefit is equal to the accrued benefit as of the date of termination.
Pre-Retirement Death Benefit:	
While in active service	The greater of 50% of the Member's accrued benefit or a benefit based on 20 years of service. The benefit may not exceed 45% of Average Computation Pay.
After leaving active service, with less than five years	A lump sum benefit equal to the return of member contributions with interest.
After leaving active service, with at least five years	50% of the Member's accrued benefit, with no early retirement reduction, or a refund of member contributions
Post-Retirement Death Benefit:	50% of the pension the Member was receiving at the time of their death.
Qualified Surviving Children Benefit:	50% of the pension the Member was receiving at the time of their death, divided equally among the children, paid until the youngest child is 19 years old or for life if the child becomes handicapped prior to age 23
Minimum Survivor Benefit:	$1,100 per month, not to exceed the actual amount the Member was receiving upon their death. If there are no Qualified Surviving Children, the minimum benefit to a spouse who is a Qualified Survivor shall be $1,200 per month. If the Member had less than 20 years of Pension Service, the minimum benefit will be prorated based on actual years of Pension Service.

Special Survivor Benefit:	
Eligibility	Upon leaving active service or joining DROP: a) the Member was at least 55 years old with at least 20 years of pension service, or b) the sum of the Member's age plus Pension Service was at least 78; **and** Has no Qualified Surviving Children or handicapped children currently eligible for survivor benefits; **and** Whose Qualified Surviving Spouse is at least 55 years old. The Qualified Surviving Spouse does not have to be 55 years old at the time of the Member's death.
Amount	Once all the eligibility conditions are met, the amount the Qualified Surviving Spouse will receive increases from 50% of the Member's pension benefit to a percentage of the Member's pension benefit based on 2.5% times the number of years of Pension Service the Member worked.
Survivor Benefit if No Qualified Surviving Spouse:	A lump sum that is the actuarial equivalent of 120 monthly payments of the greater of: 50% of the Member's pension benefit at the time of their death, or a benefit based on 20 years of the Member's service.
DROP:	
Eligibility	Members in active service who are retirement eligible may elect to enter the Deferred Retirement Option Plan (DROP).
Distribution	The DROP account balance will be paid over the expected future lifetime of annuitants.
Interest	Based on United States Department of Commerce Daily Treasury Yield Curve Rates for durations between 5 and 30 years; interest rate is based on the expected lifetime of the members at the time they retire.
Cost of Living:	The Board may grant an ad hoc COLA based on the actual market return over the prior five years less 5%, not to exceed 4% of the base benefit, if, after granting a COLA, the funded ratio on a market value of assets basis is no less than 70%.
Member Contributions:	13.5% of computation pay for all members
City Contributions:	The City will contribute 34.5% of computation payroll each year. However, in no case shall the City's total contribution amount be less than: $5,173,000 for the biweekly pay periods beginning with the first biweekly pay period that begins after September 1, 2017 and ends on the last day of the first biweekly pay period that ends after December 31, 2017; $5,344,000 for the following 26 pay periods; $5,571,000 for the following 26 pay periods; $5,724,000 for the following 26 pay periods; $5,882,000 for the following 26 pay periods; $6,043,000 for the following 26 pay periods; $5,812,000 for the following 26 pay periods; and $6,024,000 for the following 26 pay periods. An additional 1/26th of $13 million will be paid biweekly beginning with the first biweekly pay period that begins after September 1, 2017 and ending with the last biweekly pay period that ends after December 31, 2024.
Optional Forms of Benefits:	Life Annuity with 36 months guaranteed; 50% or 75% Husband-and-Wife Pension with Pop-Up; 66-2/3% or 100% Joint and Survivor Pension.
Changes in Plan Provisions:	Active members who elected to enter DROP prior to June 1, 2017 were eligible to revoke the DROP election during the period September 1, 2017 through February 28, 2018.

Section 5: GASB Information

EXHIBIT 1 – NET PENSION LIABILITY

The components of the net pension liability at December 31, 2017 were as follows:

Total pension liability	$4,497,347,017
Plan fiduciary net position	2,103,345,471
Net pension liability	2,394,001,546
Plan fiduciary net position as a percentage of the total pension liability	46.77%

The December 31, 2017 Total Pension Liability does not include the plan provision allowing members who entered DROP before June 1, 2017 to revoke the DROP election during the period from September 1, 2017 through February 28, 2018, since the election window closed after the measurement date.

Actuarial assumptions. The total pension liability was determined by an actuarial valuation as of January 1, 2018, using the following actuarial assumptions, applied to all periods included in the measurement:

Inflation	2.75%
Real rate of return	4.50%
Investment rate of return	7.25%, net of pension plan investment expense, including inflation

The actuarial assumptions used in the January 1, 2018 valuation were based on the results of an experience study for the period January 1, 2010 to December 31, 2014, plus assumption changes included in the January 1, 2017 and January 1, 2018 valuations. Assumptions are detailed in Section 4, Exhibit I of this report.

The long-term expected rate of return on pension plan investments was determined using a building-block method in which best-estimate ranges of expected future real rates of return (expected returns, net of pension plan investment expense and inflation) are developed for each major asset class. These ranges are combined to produce the long-term expected rate of return by weighting the expected future real rates of return by the target asset allocation percentage and by adding expected inflation. Best estimates of arithmetic real rates of return for each major asset class included in the pension plan's target asset allocation as of December 31, 2017 are summarized in the table on the following page.

Asset Class	Target Allocation	Long-Term Expected Real Rate of Return[1]
Global Equity	20%	6.54%
Emerging Market Equity	5%	9.41%
Private Equity	5%	10.28%
Short-Term Core Bonds	2%	1.25%
Global Bonds	3%	1.63%
High Yield	5%	4.13%
Bank Loans	6%	3.46%
Structured Credit and Absolute Return	6%	5.38%
Emerging Markets Debt	6%	4.42%
Private Debt	5%	7.30%
Natural Resources	5%	7.62%
Infrastructure	5%	6.25%
Real Estate	12%	4.90%
Liquid Real Assets	3%	4.71%
Asset Allocation	10%	4.90%
Cash	2%	1.06%
Total	100%	

[1]As provided by Segal Marco Advisors, a member of The Segal Group. The real rates of return are net of inflation.

Discount rate: The discount rate used to measure the total pension liability was 7.25%. The projection of cash flows used to determine the discount rate assumed City contributions will be made in accordance with the provisions of House Bill 3158, including statutory minimums through 2024 and 34.50% of computation pay thereafter. Members are expected to contribute 13.50% of computation pay. For cash flow purposes, projected payroll is based on 90% of the City's Hiring Plan payroll projections through 2037, increasing by 2.75% per year thereafter. This payroll projection is used for cash flow purposes only and does not impact the Total Pension Liability. The normal cost rate for future members is assumed to be 14.60% for all years. Based on these assumptions, the System's fiduciary net position was projected to be available to make all projected future benefit payments of current plan members. Therefore, the long-term expected rate of return on pension plan investments was applied to all periods of projected benefit payments to determine the total pension liability.

Actuarial cost method: In accordance with GASB 67, the Total Pension Liability for active members is valued as the total present value of benefits once they enter the DROP. For the funding valuation, the liability for these members accumulates from their entry age until they are assumed to leave active service.

Sensitivity of the net pension liability to changes in the discount rate. The following presents the net pension liability, calculated using the discount rate of 7.25%, as well as what the net pension liability would be if it were calculated using a discount rate that is one percentage-point lower (6.25%) or one percentage-point higher (8.25%) than the current rate:

	1% Decrease (6.25%)	Current Discount (7.25%)	1% Increase (8.25%)
Net pension liability	$2,886,443,863	$2,394,001,546	$1,980,919,718

EXHIBIT 2 – SCHEDULE OF CHANGES IN NET PENSION LIABILITY

	2017	2016
Total pension liability		
• Service cost	$148,551,831	$167,432,312
• Interest	348,171,140	360,567,435
• Change of benefit terms	-1,167,597,186	0
• Differences between expected and actual experience	-134,664,749	-77,462,935
• Changes of assumptions	-2,851,241,104	-712,003,982
• Benefit payments, including refunds of member contributions	-296,153,811	-825,092,132
Net change in total pension liability	**-$3,952,933,879**	**-$1,086,559,302**
Total pension liability – beginning	**8,450,280,896**	**9,536,840,198**
Total pension liability – ending (a)	**$4,497,347,017**	**$8,450,280,896**
Plan fiduciary net position		
• Contributions – employer	$126,318,005	$119,345,000
• Contributions – employee	32,977,425	25,518,317
• Net investment income	106,656,217	164,790,956
• Benefit payments, including refunds of member contributions	-296,153,811	-825,092,132
• Administrative expense	-8,089,584	-9,492,445
• Interest expense	-9,024,584	-4,532,196
Net change in plan fiduciary net position	**-$47,316,332**	**-$529,462,500**
Plan fiduciary net position – beginning	**2,150,661,803**	**2,680,124,303**
Plan fiduciary net position – ending (b)	**$2,103,345,471**	**$2,150,661,803**
Net pension liability – ending (a) – (b)	**$2,394,001,546**	**$6,299,619,093**
Plan fiduciary net position as a percentage of the total pension liability	**46.77%**	**25.45%**
Covered employee payroll	**$346,036,690**	**$357,414,472**
Net pension liability as percentage of covered employee payroll	**691.83%**	**1,762.55%**

Notes to Schedule:

Benefit changes: Plan changes effective September 1, 2017 that were signed into law May 31, 2017 as HB 3158 are reflected for the first time in the December 31, 2017 total pension liability, along with assumption changes that were implemented as part of the plan changes. These changes are summarized in Section 1 of the January 1, 2017 actuarial valuation, except that the COLA start date has been updated from October 1, 2049 to October 1, 2053 and the interest rate for the annuitization of DROP balances upon retirement has been updated from 2.75% to 3.00%.

Change of Assumptions: The blended discount rate increased from 3.95% to 4.12% as of December 31, 2016, and from 4.12% to 7.25% as of December 31, 2017. The assumption changes in 2016 also included updates to the salary scale to reflect the Meet and Confer Agreement, and a change to the expected DROP interest payable.

EXHIBIT 3 – SCHEDULE OF EMPLOYER CONTRIBUTIONS

Year Ended December 31	Actuarially Determined Contributions	Contributions in Relation to the Actuarially Determined Contributions[1]	Contribution Deficiency (Excess)	Covered-Employee Payroll	Contributions as a Percentage of Covered Employee Payroll
2015[2]	- -	$114,885,723	- -	$383,006,330	30.00%
2016	$261,859,079	119,345,000	$142,514,079	365,210,426	32.68%
2017	168,865,484	126,318,005	42,547,479	357,414,472	35.34%

[1]The City's contributions are based on statutory rates set by State law and not on Actuarially Determined Contributions.

[2]The Actuarially Determined Contribution was not directly calculated as a dollar amount by the prior actuary for the year ended 2015.

Notes to Schedule:

Methods and assumptions used to determine contribution rates for the year ended December 31, 2017:

Valuation date	Actuarially determined contribution is calculated using a January 1, 2017 valuation date as of the beginning of the year in which contributions are reported
Actuarial cost method	Entry age
Amortization method	30-year level percent of payroll, using 2.75% annual increases
Remaining amortization period	Infinite as of January 1, 2017
Asset valuation method	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 actuarial value, and is recognized over a five-year period, further adjusted, if necessary, to be within 20% of the market value.
Investment rate of return	7.25%, including inflation, net of pension plan investment expense
Inflation rate	2.75%
Projected salary increases	Inflation plus merit increases, varying by group and service
Retirement rates	Group-specific rates based on age
Cost-of-living adjustments	2.00% simple increases starting October 1, 2049

Mortality:	
Pre-retirement	Sex-distinct RP-2014 Employee Mortality Table, set back two years for males, projected generationally using Scale MP-2015
Healthy annuitant	Sex-distinct RP-2014 Healthy Annuitant Mortality Table, set forward two years for females, projected generationally using Scale MP-2015
Disabled	Sex-distinct RP-2014 Disabled Retiree Mortality Table, set back three years for males and females, projected generationally using Scale MP-2015
Other information	See Section 4 of the January 1, 2017 actuarial valuation for a full outline of assumptions. See Exhibit 2 of this Section for the history of changes to plan provisions and assumptions over the last two years.
DROP utilization	0% of Police and Fire members are assumed to elect to enter DROP
Interest on DROP Accounts	6.00% per annum, until September 1, 2017 Beginning September 1, 2017: – 2.75% on annuitant account balances – 2.75% payable upon retirement on active account balances as of September 1, 2017 – 0.00% on active account balances accrued after September 1, 2017

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Dallas Police and Fire Pension System Supplemental Plan

Actuarial Valuation and Review as of January 1, 2018

Segal Consulting
2018 Powers Ferry Road, Suite 850 Atlanta, GA 30339-7200
T 678.306.3100 www.segalco.com

September 11, 2018

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

Dear Board Members:

We are pleased to submit this Actuarial Valuation and Review as of January 1, 2018. It summarizes the actuarial data used in the valuation, analyzes the preceding year's experience, and establishes the funding requirements for fiscal 2018.

This report was prepared in accordance with generally accepted actuarial principles and practices at the request of the Board to assist in administering the Supplemental Plan. The census information on which our calculations were based was prepared by the System's IT Department under the supervision of John Holt, and the financial informatin was provided by the System's Finance Department. That assistance is gratefully acknowledged.

The actuarial calculations were directed under our supervision. We are members of the American Academy of Actuaries and we meet 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 Plan. Since the members in this Supplemental Plan are a subset of the Dallas Police and Fire Pension System Combined Pension Plan, and since the assets are invested together, the same assumptions are used for both. Changes impacting the larger plan will impact this one as well.

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

Sincerely,

Segal Consulting, a Member of The Segal Group, Inc.

By: _____ _____

Jeffrey S. Williams, FCA, ASA, MAAA, EA
Vice President and Consulting Actuary

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

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Dallas Police and Fire Pension System Supplemental Plan Actuarial Valuation and Review as of January 1, 2018

Section 1: Actuarial Valuation Summary

Purpose and Basis

This report was prepared by Segal Consulting to present a valuation of the Dallas Police and Fire Pension System Supplemental Plan as of January 1, 2018. The valuation was performed to determine whether the assets and contributions are sufficient to provide the prescribed benefits and to provide information for required disclosures under Governmental Accounting Standards Board (GASB) Statement No. 67. 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 Plan assets to cover the estimated cost of settling the Plan'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.

Certain disclosure information required by GASB Statement No. 68 as of September 30, 2018 for the City will be provided in a separate report.

The contribution requirements presented in this report are based on:

- The benefit provisions of the Pension Plan, as administered by the Board;
- The characteristics of covered active members, inactive vested members and inactive members due a refund of contributions, and retired members and beneficiaries as of December 31, 2017, provided by the System's IT Department;
- The unaudited assets of the Plan as of December 31, 2017, provided by the System's Finance Department;
- Economic assumptions regarding future salary increases and investment earnings; and
- Other actuarial assumptions regarding employee terminations, retirement, death, etc.

The majority of the assumptions and methods used to value the Plan were set by the Board based on recommendations made by Segal Consulting following a five-year experience study for the period ended December 31, 2014. Additional assumption changes were made as part of the plan changes effective September 1, 2017, as well as the Meet and Confer Agreement for salary scale purposes through 2019. Assumptions are reviewed and updated annually as needed.

Significant Issues

1. The City's actuarially determined contribution for the upcoming year is $2,273,581, an increase of $186,942 from last year. The contribution is based on a ten-year level percent-of-payroll amortization of the unfunded actuarial accrued liability.
2. Segal Consulting ("Segal") recommends an actuarial funding method that targets 100% funding of the actuarial accrued liability. Generally, this implies payments that are ultimately at least enough to cover normal cost, interest on the unfunded actuarial accrued liability and the principal balance. The funding policy for the Plan reflects an open, or rolling, ten-year amortization period. A ten-year period is relatively short compared to other systems, and as long as the City pays the contribution on this basis, the normal cost, interest, and a portion of the principal will be covered. Therefore the unfunded liability is expected to decrease if all assumptions are met. However, the unfunded liability will never be paid off in full because the remaining principal is reamortized annually. Thus, the funded ratio should approach 100% over time, but full funding will not occur unless there are experience gains from other sources.
3. The rate of return on the market value of assets was 4.24% for the 2017 plan year. This return was in line with short-term expectations, as the System works to rebalance its investment portfolio. The 4.24% return resulted in an actuarial loss of $523,509, or 1.6% of actuarial accrued liability, when measured against the assumed rate of return of 7.25%. Based on the System's investment targets, Segal continues to support 7.25% as a reasonable long-term net investment return assumption. However, we will continue to monitor actual and anticipated returns.
4. The net experience loss from sources other than investment experience was also 1.6% of liability, prior to reflection of assumption and plan changes. This loss was primarily due to a 95% increase in average supplemental computation pay. The pay is subject to significant fluctuations from year to year, due to the excess pay nature of the Supplemental Plan.
5. Actual City contributions made during the plan year ending December 31, 2017 were $2,077,059, 99.5% of the actuarially determined contribution. In the prior fiscal year, actual City contributions were $3,063,584, 100.0% of the prior year actuarially determined contribution.
6. Although the City paid almost 100% of the required contribution during the plan year ending December 31, 2017, the experience losses incurred during the year mean that the total contributions made were insufficient to reduce the unfunded actuarial accrued liability. The unfunded actuarial accrued liability as of the valuation date is $16,744,953, which is an increase of $1,024,658 since the prior valuation.
7. The funded ratio (the ratio of assets to actuarial accrued liability) is 51.5%, compared to the prior year funded ratio of 52.9%. This ratio is one measure of funding status, and its history is a measure of funding progress. This measurement is not necessarily appropriate for assessing the sufficiency of Plan assets to cover the estimated cost of settling the Plan's benefit obligation or the need for or the amount of future contributions.

8. The following actuarial assumptions were changed with this valuation:
   - The administrative expense assumption was increased from $60,000 to $65,000.
   - The interest rate assumption payable upon retirement on DROP accounts as of September 1, 2017 was increased from 2.75% to 3.00%.
   - The ad-hoc COLA assumption was updated to begin October 1, 2053 based on the updated projection of the unfunded actuarial accrued liability of the main plan; last year's assumption was that the COLA would begin October 1, 2049.

   As a result of these assumption changes, the total normal cost decreased by $1,182 and the actuarial accrued liability decreased by $17,284. The total impact was a decrease in the actuarially determined contribution of $3,378.
9. Active members who elected DROP prior to June 1, 2017 were eligible to revoke the DROP election during the period from September 1, 2017 to February 28, 2018. This plan change is included for the first time in this valuation, and it resulted in a normal cost increase of $12,032 and an increase in actuarial accrued liability of $897,084. The total impact was an increase in the actuarially determined contribution of $123,041.
10. This actuarial report as of January 1, 2018 is based on financial and demographic data as of December 31, 2017, plus the impact of DROP revocations that occurred between January 1, 2018 and February 28, 2018. Subsequent changes are not reflected and will affect future actuarial costs of the plan.
11. This report constitutes an actuarial valuation for the purpose of determining the actuarially determined employer contribution under (ADEC) the Plan's funding policy and measuring the progress of that funding policy. The information contained in Section 5 provides the accounting information for Governmental Accounting Standards Board (GASB) Statement No. 67, for inclusion in the plan and employer's financial statements as of December 31, 2017. The Net Pension Liability (NPL) and Pension Expense under Governmental Accounting Standards Board (GASB) Statement No. 68, for inclusion in the plan and employer's financial statements as of September 30, 2018, will be provided separately.
12. The Net Pension Liability (NPL) is equal to the difference between the Total Pension Liability (TPL) and the Plan's fiduciary net position (equal to the market value of assets). The NPL as of December 31, 2017 is $15.9 million, a decrease from $23.0 million as of December 31, 2016.
13. 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.

Summary of Key Valuation Results

		2018	2017
Contributions for plan year beginning January 1, adjusted for timing:	• Total actuarially determined contribution (City and Member)	$2,407,912	$2,132,808
	• Expected member contributions	134,331	46,169
	• City's actuarially determined employer contribution (ADEC)	2,273,581	2,086,639
	• Actual City contributions	--	$2,077,059
	• Amortization period for determination of ADEC	10 years	10 years
Actuarial accrued liability for plan year beginning January 1:	• Retired members and beneficiaries	$30,668,245	$30,160,174
	• Inactive vested participants	11,861	- -
	• Active participants	3,870,000	3,223,660
	• Total	34,550,106	33,383,834
	• Employer normal cost including administrative expenses	179,963	122,779
Assets for plan year beginning January 1:	• Actuarial (Market) value of assets	$17,805,153	$17,663,539
Funded status for plan year beginning January 1:	• Unfunded actuarial accrued liability	$16,744,953	$15,720,295
	• Funded percentage	51.53%	52.91%
Key assumptions:	• Net investment return	7.25%	7.25%
	• Inflation rate	2.75%	2.75%
	• Payroll increase	2.75%	2.75%
GASB information:	• Discount rate	7.25%	7.10%
	• Total pension liability	$33,670,180	$40,647,671
	• Plan fiduciary net position	17,805,153	17,670,327
	• Net pension liability	15,865,027	22,977,344
	• Plan fiduciary net position as a percentage of total pension liability	52.88%	43.47%
Demographic data for plan year beginning January 1:	• Number of retired members and beneficiaries	140	128
	• Number of inactive vested members	1	- -
	• Number of active members	44	47
	• Total supplemental computation pay	$960,825	$525,048
	• Average supplemental computation pay	21,837	11,171

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 Consulting ("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 System. Segal does not audit such data for completeness or accuracy, other than reviewing it for obvious inconsistencies compared to prior data and other information that appears unreasonable. It is important for Segal to receive the best possible data and to be informed about any known incomplete or inaccurate data.
Assets	The valuation is based on the market value of assets as of the valuation date, as provided by the System. The System 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.

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

Section 2: Actuarial Valuation Results

Member Data

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

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

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

MEMBER POPULATION: 2008 – 2017

Year Ended December 31	Active Members	Inactive Vested Members	Retired Members and Beneficiaries	Total Non-Actives	Ratio of Non-Actives to Actives
2008	41	- -	112	112	2.73
2009	40	- -	112	112	2.80
2010	39	- -	113	113	2.90
2011	37	- -	113	113	3.05
2012	39	- -	120	120	3.08
2013	38	- -	120	120	3.16
2014	39	- -	122	122	3.13
2015	45	- -	124	124	2.76
2016	47	- -	128	128	2.72
2017	44	1	140	141	3.20

Active Members

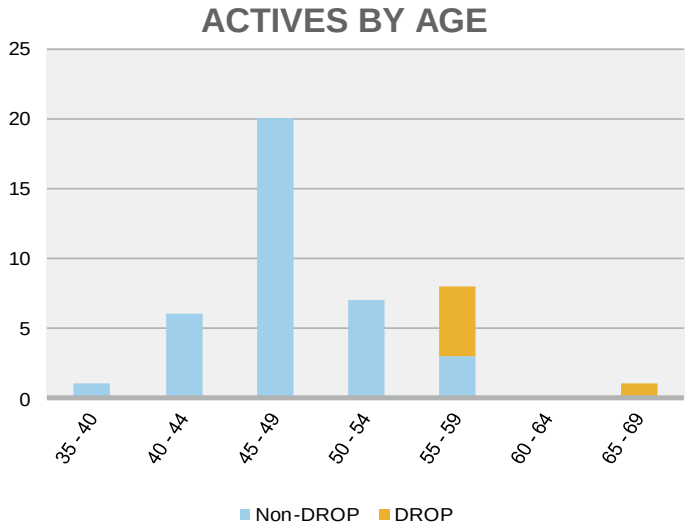
Plan costs are affected by the age, years of service and supplemental computation pay of active members. In this year's valuation, there were 44 active members with an average age of 49.8, average years of service of 24.3 years and average supplemental computation pay of $21,837. The 47 active members in the prior valuation had an average age of 50.1, average service of 26.4 years and average supplemental computation pay of $11,171.

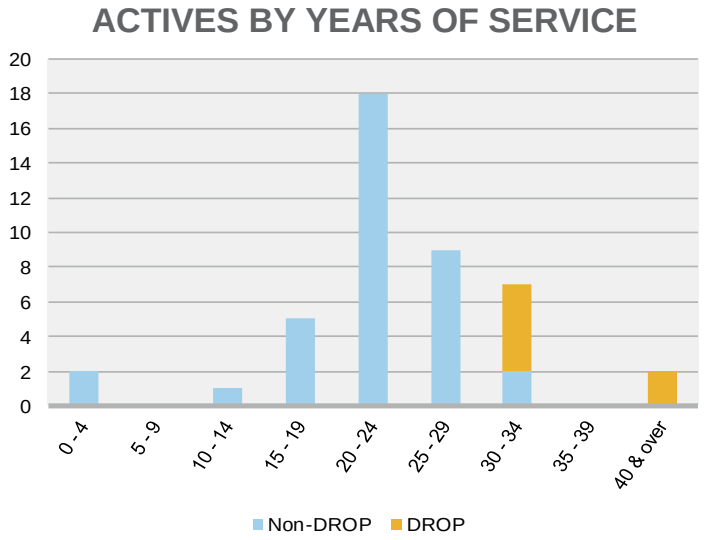
The number of active Firefighters increased from 15 to 17 as of December 31, 2017. The average age of this group is 49.8, the average years of service is 22.8, and the average supplemental computation pay is $24,106. Last year these averages were 50.8, 26.6 and $7,330, respectively.

The number of active Police Officers decreased from 32 to 27 as of December 31, 2017. The average age of this group decreased from 49.8 to 49.7, and the average years of service decreased from 26.2 to 25.2. The average supplemental computation pay increased from $12,972 to $20,408.

The number of active participants participating in DROP decreased significantly, from 16 at the end of 2016 to 7 at the end of 2017.

Distribution of Active Participants as of December 31, 2017





Inactive Members

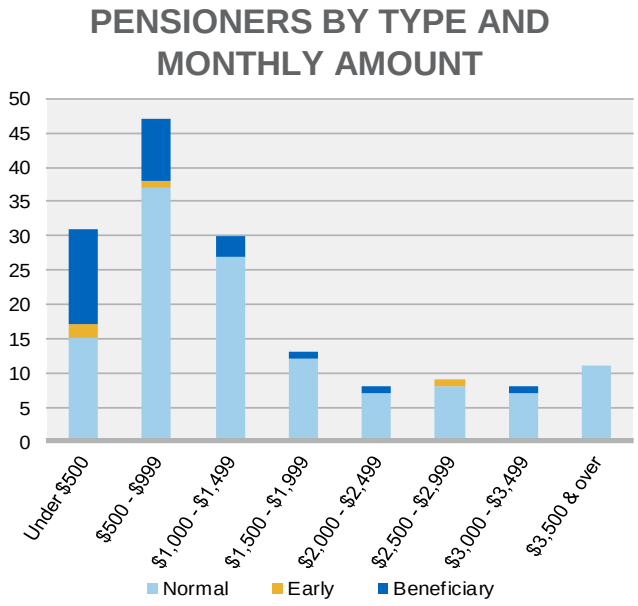
In this year's valuation, there was one member with a vested right to a deferred or immediate vested benefit, compared to none last year.

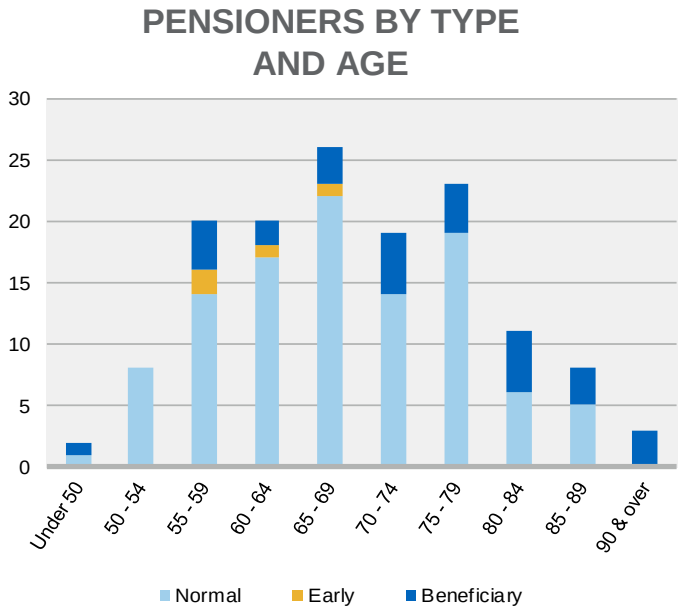
Retired Members and Beneficiaries

As of December 31, 2017, 110 retired members and 30 beneficiaries were receiving total monthly benefits of $205,026. For comparison, in the previous valuation, there were 100 retired members and 28 beneficiaries receiving monthly benefits of $198,156.

As of December 31, 2017, the average monthly benefit for retired members is $1,464, compared to $1,548 in the previous valuation. The average age for retired members is 69.5 in the current valuation, compared with 69.5 in the prior valuation.

Distribution of Pensioners as of December 31, 2017





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.

MEMBER DATA STATISTICS: 2008 – 2017

	Active Participants			Retired Members and Beneficiaries		
Year Ended December 31	Count	Average Age	Average Service	Count	Average Age[1]	Average Monthly Amount
2008	41	51.5	25.9	112	--	$1,228
2009	40	51.7	26.6	112	--	1,264
2010	39	52.1	27.5	113	--	1,331
2011	37	53.1	29.0	113	--	1,384
2012	39	49.9	24.2	120	--	1,381
2013	38	49.6	26.0	120	--	1,402
2014	39	50.2	26.6	122	--	1,406
2015	45	50.5	26.7	124	69.3	1,452
2016	47	50.1	26.4	128	69.5	1,548
2017	44	49.8	24.3	140	69.5	1,464

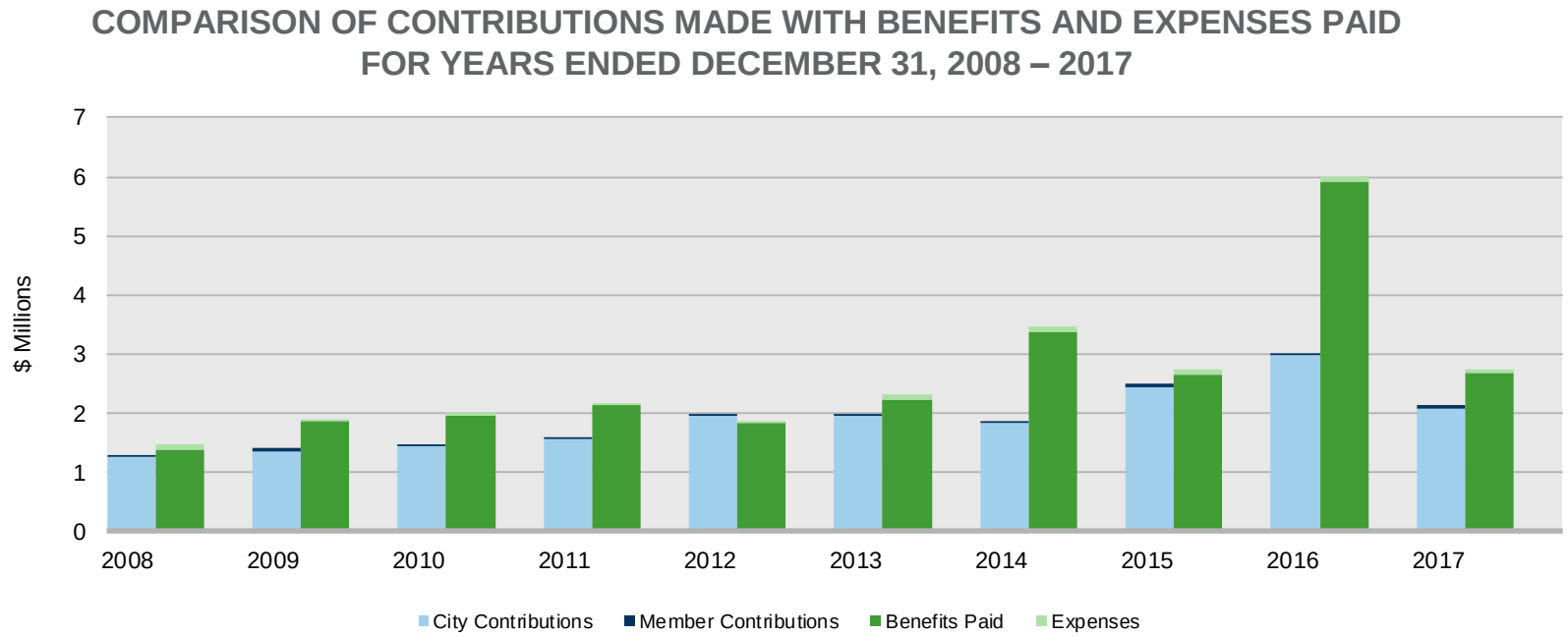
[1]Information for December 31, 2014 and earlier is not available.

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.

Benefit payments in 2016 totaled $5.9 million, of which $3.8 million were DROP lump sum payments. This was a one-time event, as members reacted to pending changes in the plan provisions. DROP balances have been annuitized, which should result in more predictable benefit payment levels in the future.

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



It is desirable to have level and predictable plan costs from one year to the next. However, the Board has approved an asset valuation method that uses market value. Under this valuation method, the full value of market fluctuation is recognized in a single year and, as a result, the asset value and the plan costs are relatively volatile. The Supplemental Plan is small compared to the Combined Pension Plan, and City contributions to this plan are less than 2% of the total amount that the City contributes to the System. Thus, some volatility can be withstood.

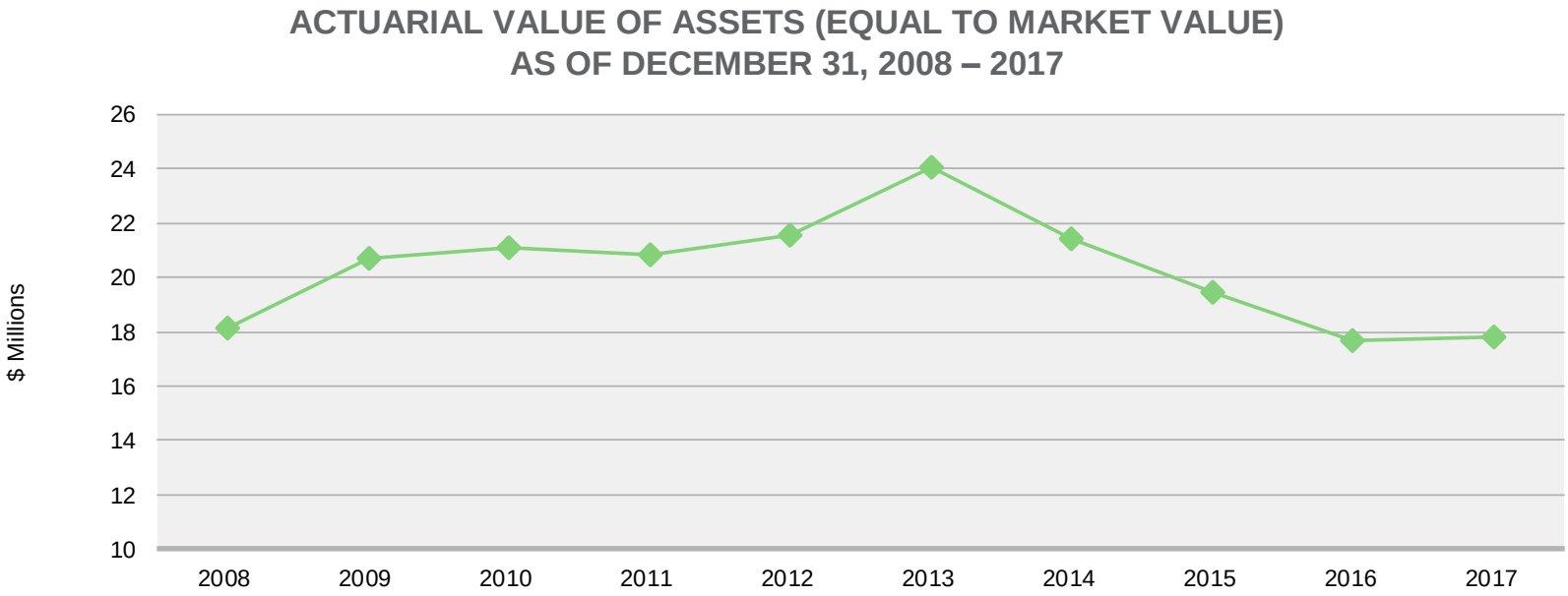
The Board has the option to adopt an asset "smoothing" method in the future should they decide the current method (using market value) is producing undesirable fluctuations.

DETERMINATION OF ACTUARIAL VALUE OF ASSETS FOR YEAR ENDED DECEMBER 31, 2017

1.	Actuarial value of assets = Market value of assets	$17,805,153

The actuarial value (equal to the market value of assets) is a representation of the Plan's financial status. The actuarial asset value is significant because the Plan'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.

The decline in asset values from 2013 to 2015 was primarily the result of significant write-downs in the Plan's asset holdings. The decline from 2015 to 2016 reflects the unusually large number of DROP payments made in 2016.



Actuarial Experience

To calculate any actuarially determined 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 $1,045,579, which includes $523,509 from investment losses and $522,070 in losses from all other sources. The net experience variation from individual sources other than investments was 1.6% 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, 2017

1	Net loss from investments[1]	-$523,509
2	Net loss from administrative expenses	-8,832
3	Net loss from other experience	-513,238
4	Net experience loss: 1 + 2 + 3	-$1,045,579

[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 Plan's investment policy.

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 2017 plan year was 4.24%. Since the actual return for the year was less than the assumed return, the Plan experienced an actuarial loss during the year ended December 31, 2017 with regard to its investments.

INVESTMENT EXPERIENCE

		Year Ended December 31, 2017	Year Ended December 31, 2016
		Actuarial (Market) Value	Actuarial (Market) Value
1	Net investment income	$735,567	$1,176,323
2	Average value of assets	17,366,563	17,971,961
3	Rate of return: 1 ÷ 2	4.24%	6.55%
4	Assumed rate of return	7.25%	7.25%
5	Expected investment income: 2 x 4	1,259,076	1,302,967
6	Actuarial gain/(loss): 1 – 5	-$523,509	-$126,644

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 for the last ten years, including averages over select time periods.

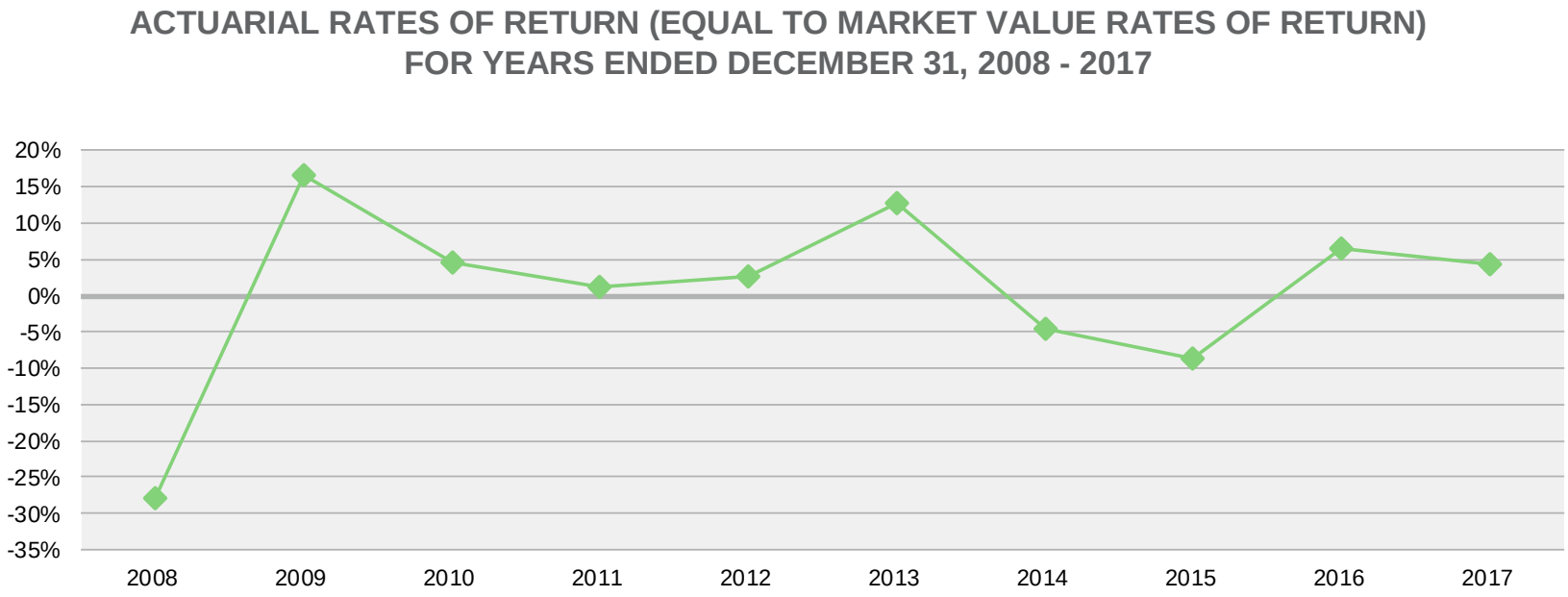
INVESTMENT RETURN – ACTUARIAL VALUE OF ASSETS (EQUAL TO MARKET VALUE): 2008 - 2017

	Actuarial (Market) Value Investment Return[1]	
Year Ended December 31	Amount	Percent
2008	-$7,039,494	-27.92%
2009	2,985,884	16.66
2010	924,634	4.52
2011	252,054	1.21
2012	578,432	2.77
2013	2,712,000	12.65
2014	-1,091,374	-4.69
2015	-1,828,695	-8.56
2016	1,176,323	6.55
2017	735,567	4.24
Total	-$594,669	
Most recent five-year average return		1.68%
Most recent ten-year average return		-0.29%

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

[1]Returns for years 2014 and 2015 include significant write-downs of the Plan's assets.

The actuarial value of assets has been equal to market value for the last ten years. This, combined with recent asset write-downs, has resulted in relatively volatile actuarial rates of return and pension plan cost.



Administrative Expenses

Administrative expenses for the year ended December 31, 2017 totaled $68,528 compared to the assumption of $60,000, payable monthly. This resulted in a loss of $8,832 for the year, when adjusted for timing. We have increased the assumption from $60,000 to $65,000, payable monthly, for the current year.

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),
- mortality (more or fewer deaths than projected),
- the number of disability retirements (more or fewer than projected), and
- salary increases (greater or smaller than projected).

The net loss from this other experience for the year ended December 31, 2017 amounted to $513,238, which is 1.6% of the actuarial accrued liability. This loss was primarily due to a 95% increase in average supplemental computation pay. The excess pay nature of the Supplemental Plan lends itself to potentially significant gains and losses in a single year.

Changes in the Actuarial Accrued Liability

The actuarial accrued liability as of January 1, 2018 is $34,550,106, an increase of $1,166,272, or 3.5%, from the actuarial accrued liability as of the prior valuation date. The liability is expected to grow each year with normal cost and interest, and to decline due to benefit payments made. Additional fluctuations can occur due to actual experience that differs from expected (as discussed in the previous subsection).

Actuarial Assumptions

The assumption changes reflected in this report are:

- The DROP account interest rate assumption for the annuitization of September 31, 2017 DROP balances was increased from 2.75% to 3.00%.
- The COLA is assumed to begin October 1, 2053 based on the year the System is projected to be 70% funded on a market value basis; last year's assumption was that the COLA would begin October 1, 2049.
- Administrative expenses increased from $60,000 to $65,000 for the year beginning January 1, 2018.
- These changes decreased the actuarial accrued liability by 0.05% and decreased the normal cost by 0.48%.
- Details on actuarial assumptions and methods are in *Section 4, Exhibit I.*

Plan Provisions

The plan change reflected in this report is:

- Members who entered DROP before June 1, 2017 were allowed to revoke the DROP election during the period from September 1, 2017 through February 28, 2018. The valuation reflects these DROP revocations.
- These changes increased the actuarial accrued liability by 2.66% and increased the normal cost by 5.10%.
- A summary of plan provisions is in Section 4, Exhibit II.

Development of Unfunded Actuarial Accrued Liability

DEVELOPMENT FOR YEAR ENDED DECEMBER 31, 2017

1	Unfunded actuarial accrued liability at beginning of year		$15,720,295
2	Normal cost at beginning of year		167,359
3	Total contributions		-2,143,154
4	Interest		
	• For whole year on 1 + 2	$1,151,855	
	• For half year on 3	-76,781	
	Total interest		1,075,074
5	Expected unfunded actuarial accrued liability		$14,819,574
6	Changes due to:		
	• Net experience loss	$1,045,579	
	• Plan provisions	897,084	
	• Assumptions	-17,284	
	Total changes		$1,925,379
7	Unfunded actuarial accrued liability at end of year		$16,744,953

Actuarially Determined Contribution

The actuarially determined contribution is equal to the employer normal cost payment and a payment on the unfunded actuarial accrued liability. As of January 1, 2018, the actuarially determined contribution is $2,273,581.

The funding policy used to calculate the actuarially determined contribution is based on an open amortization period of ten years. The payment on the unfunded actuarial accrued liability accounts for nearly 92% of the City's recommended contribution.

The contribution requirement as of January 1, 2018 are 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.

ACTUARIALLY DETERMINED CONTRIBUTION FOR YEAR BEGINNING JANUARY 1

		2018	2017
1.	Total normal cost	$246,909	$109,422
2.	Assumed administrative expenses	62,765	57,937
3.	Expected member contributions	-129,711	-44,580
4.	Employer normal cost: (1) + (2) - (3)	$179,963	$122,779
5.	Actuarial accrued liability	$34,550,106	$33,383,834
6.	Actuarial value of assets	17,805,153	17,663,539
7.	Unfunded actuarial accrued liability: (5) - (6)	$16,744,953	$15,720,295
8.	Payment on unfunded actuarial accrued liability	2,015,427	1,892,099
9.	Adjustment for timing[1]	78,190	71,761
10.	Actuarially determined employer contribution: (4) + (8) + (9)	$2,273,581	$2,086,639
11.	Total supplemental computation pay	$960,825	$525,048

[1]Actuarially determined contributions are assumed to be paid at the middle of every year.

Reconciliation of Actuarially Determined Contribution

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

RECONCILIATION OF ACTUARIALLY DETERMINED CONTRIBUTION FROM JANUARY 1, 2017 TO JANUARY 1, 2018

	Amount
Actuarially Determined Contribution as of January 1, 2017	$2,086,639
• Effect of maintaining ten-year amortization period	-176,258
• Effect of DROP revocations	118,041
• Effect of investment loss	71,070
• Effect of expected change in amortization payment due to payroll growth	53,886
• Effect of change in administrative expense assumption	5,000
• Effect of other changes in actuarial assumptions	-3,378
• Effect of contributions more than actuarially determined contribution	-1,516
• Effect of other gains and losses on accrued liability	70,875
• Net effect of other changes, including composition and number of participants	49,222
Total change	$186,942
Actuarially Determined Contribution as of January 1, 2018	$2,273,581

History of Employer Contributions

A history of the most recent years of contributions is shown below.

HISTORY OF EMPLOYER CONTRIBUTIONS: 2011 – 2018

Fiscal Year Ended December 31	Actuarially Determined Employer Contribution (ADEC)[1]	Actual Employer Contribution	Percent Contributed
2011	$1,543,717	$1,543,717	100.00%
2012	1,954,022	1,954,022	100.00%
2013	1,935,588	1,935,588	100.00%
2014	1,817,136	1,817,136	100.00%
2015	2,442,790	2,442,790	100.00%
2016	3,063,584	3,063,584	100.00%
2017	2,086,639	2,077,059	99.54%
2018	2,273,581	N/A	N/A

[1]Prior to 2015, this amount was the Annual Required Contribution (ARC).

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.

The contributions of this Plan can fluctuate significantly from year to year, due to its nature as an excess pay plan and the fact that the covered population is small, The assets are likely to fluctuate considerably from year to year as well, since there is no smoothing method in place. As mentioned previously, City contributions to this Plan are less than 2% of the total amount that the City contributes to the System, and therefore some volatility can be withstood.

This report does not contain a detailed analysis of the potential range of future measurements; the Combined Plan valuation report includes a discussion of risk factors that may impact the System, and as a result, this Plan. Upon request, a more detailed assessment can be provided to enable a better understanding of the specific risks.

GFOA Solvency Test

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. As noted previously, the use of a rolling ten-year amortization period means the unfunded actuarial accrued liability is projected to decline each year, but will never fully be paid off.

GFOA SOLVENCY TEST AS OF DECEMBER 31

	2018	2017
Actuarial accrued liability (AAL)		
• Active member contributions	$170,398	$106,211
• Retirees and beneficiaries	30,668,245	30,160,174
• Active and inactive members (employer-financed)	3,711,463	3,117,449
Total	$34,550,106	$33,383,834
Actuarial value of assets	$17,805,153	$17,663,539
Cumulative portion of AAL covered		
• Active member contributions	100.00%	100.00%
• Retirees and beneficiaries	57.50%	58.21%
• Active and inactive members (employer-financed)	0.00%	0.00%

Actuarial Balance Sheet

An overview of the Plan's funding is given by an Actuarial Balance Sheet. In this approach, first the amount and timing of all future payments that will be made by the Plan for current participants is determined. Then these payments are discounted at the valuation interest rate to the date of the valuation, thereby determining the present value, referred to as the "liability" of the Plan.

Second, this liability is compared to the assets. The "assets" for this purpose include the net amount of assets already accumulated by the Plan, the present value of future member contributions, the present value of future employer normal cost contributions, and the present value of future employer amortization payments for the unfunded actuarial accrued liability.

ACTUARIAL BALANCE SHEET

	Year Ended	
	December 31, 2017	December 31, 2016
Liabilities		
• Present value of benefits for retired members and beneficiaries (non-DROP)	$23,148,147	$22,900,929
• Present value of benefits for retired members and beneficiaries (DROP)	7,520,098	7,259,245
• Present value of benefits for inactive vested members	11,861	0
• Present value of benefits for active members	4,925,368	3,591,198
Total liabilities	**$35,605,474**	**$33,751,372**
Assets		
• Total valuation value of assets	$17,805,153	$17,663,539
• Present value of future contributions by members	547,393	181,906
• Present value of future employer contributions for:		
» Entry age cost	507,975	185,632
» Unfunded actuarial accrued liability	16,744,953	15,720,295
Total of current and future assets	**$35,605,474**	**$33,751,372**

Section 3: Supplemental Information

EXHIBIT A – TABLE OF PLAN COVERAGE

Category	Year Ended December 31 2017	2016	Change From Prior Year
Total active members in valuation:			
• Number	44	47	-6.4%
• Average age	49.8	50.1	-0.3
• Average years of service	24.3	26.4	-2.1
• Total supplemental computation pay	$960,825	$525,048	83.0%
• Average supplemental computation pay	21,837	11,171	95.5%
• Accumulated contribution balances	170,398	106,211	60.4%
• Total active vested members	42	47	-10.6%
Active members (excluding DROP):			
• Number	37	31	19.4%
• Average age	47.8	46.5	1.3%
• Average years of service	21.8	22.2	-0.4%
• Total supplemental computation pay	$856,055	$231,730	269.4%
• Average supplemental computation pay	23,137	7,475	209.5%
Active members (DROP only):			
• Number	7	16	-56.3%
• Average age	60.3	57.2	3.1
• Average years of service	37.1	34.3	2.8
• Total supplemental computation pay	$104,770	$293,318	-64.3%
• Average supplemental computation pay	14,967	18,332	-18.4%
• DROP account balances	589,633	757,045	-22.1%
Inactive vested members:			
• Number	1	0	N/A
• Average age	47.0	N/A	N/A
• Average monthly benefit	$95	N/A	N/A

Category	Year Ended December 31 2017	2016	Change From Prior Year
Retired members:			
• Number in pay status	110	100	10.0%
• Average age	67.9	68.9	-1.0
• Average monthly benefit	$1,633	$1,752	-6.8%
Beneficiaries:			
• Number in pay status	30	28	7.1%
• Average age	75.3	74.3	1.0
• Average monthly benefit	$846	$822	2.9%

EXHIBIT B-1 – TOTAL PARTICIPANTS IN ACTIVE SERVICE AS OF DECEMBER 31, 2017 BY AGE, YEARS OF SERVICE, AND AVERAGE SUPPLEMENTAL COMPUTATION PAY

	Years of Service									
Age	Total	0 - 4	5 - 9	10 - 14	15 - 19	20 - 24	25 - 29	30 - 34	35 - 39	40 & over
35 - 39	1	- -	- -	1	- -	- -	- -	- -	- -	- -
	$2,737	- -	- -	$2,737	- -	- -	- -	- -	- -	- -
40 - 44	6	- -	- -	- -	3	3	- -	- -	- -	- -
	7,459	- -	- -	- -	$10,975	$3,942	- -	- -	- -	- -
45 - 49	20	1	- -	- -	1	14	4	- -	- -	- -
	20,021	$216,120	- -	- -	10,100	9,228	$11,251	- -	- -	- -
50 - 54	7	- -	- -	- -	- -	3	3	1	- -	- -
	24,208	- -	- -	- -	- -	13,702	28,018	$44,299	- -	- -
55 - 59	8	1	- -	- -	1	1	- -	5	- -	- -
	42,211	198,411	- -	- -	32,656	7,625	- -	19,799	- -	- -
60 - 64	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -
	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -
65 - 69	1	- -	- -	- -	- -	- -	- -	- -	- -	1
	5,777	- -	- -	- -	- -	- -	- -	- -	- -	$5,777
70 & over	1	- -	- -	- -	- -	- -	- -	- -	- -	1
	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -
Total	44	2	- -	1	5	21	7	6	- -	2
	$21,837	$207,266	- -	$2,737	$15,137	$9,036	$18,437	$23,882	- -	$2,889

Note: Chart includes members eligible for supplemental benefits based on prior supplemental computation pay but with zero excess supplemental computation pay in 2017.

EXHIBIT B-2 – POLICE PARTICIPANTS IN ACTIVE SERVICE AS OF DECEMBER 31, 2017 BY AGE, YEARS OF SERVICE, AND AVERAGE SUPPLEMENTAL COMPUTATION PAY

	Years of Service									
Age	Total	0 - 4	5 - 9	10 - 14	15 - 19	20 - 24	25 - 29	30 - 34	35 - 39	40 & over
35 - 39	1	- -	- -	1	- -	- -	- -	- -	- -	- -
	$2,737	- -	- -	$2,737	- -	- -	- -	- -	- -	- -
40 - 44	3	- -	- -	- -	- -	3	- -	- -	- -	- -
	3,942	- -	- -	- -	- -	$3,942	- -	- -	- -	- -
45 - 49	12	1	- -	- -	- -	7	4	- -	- -	- -
	25,948	$216,120	- -	- -	- -	7,179	$11,251	- -	- -	- -
50 - 54	6	- -	- -	- -	- -	2	3	1	- -	- -
	26,530	- -	- -	- -	- -	15,414	28,018	$44,299	- -	- -
55 - 59	4	- -	- -	- -	- -	1	- -	3	- -	- -
	16,477	- -	- -	- -	- -	7,625	- -	19,428	- -	- -
60 - 64	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -
	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -
65 - 69	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -
	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -
70 & over	1	- -	- -	- -	- -	- -	- -	- -	- -	1
	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -
Total	27	1	- -	1	- -	13	7	4	- -	1
	$20,408	$216,120	- -	$2,737	- -	$7,733	$18,437	$25,645	- -	- -

Note: Chart includes members eligible for supplemental benefits based on prior supplemental computation pay but with zero excess supplemental computation pay in 2017.

EXHIBIT B-3 – FIRE PARTICIPANTS IN ACTIVE SERVICE AS OF DECEMBER 31, 2017 BY AGE, YEARS OF SERVICE, AND AVERAGE SUPPLEMENTAL COMPUTATION PAY

	Years of Service									
Age	Total	1 - 4	5 - 9	10 - 14	15 - 19	20 - 24	25 - 29	30 - 34	35 - 39	40 & over
40 - 44	3	- -	- -	- -	3		- -	- -	- -	- -
	$10,975	- -	- -	- -	$10,975		- -	- -	- -	- -
45 - 49	8		- -	- -	1	7	- -	- -	- -	- -
	11,130		- -	- -	10,100	$11,277	- -	- -	- -	- -
50 - 54	1	- -	- -	- -	- -	1	- -	- -	- -	- -
	10,276	- -	- -	- -	- -	10,276	- -	- -	- -	- -
55 - 59	4	1	- -	- -	1	- -	- -	2	- -	- -
	67,944	$198,411	- -	- -	32,656	- -	- -	$20,355	- -	- -
60 - 64	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -
	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -
65 - 69	1	- -	- -	- -	- -	- -	- -	- -	- -	1
	5,777	- -	- -	- -	- -	- -	- -	- -	- -	$5,777
70 & over	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -
	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -
Total	17	1	- -	- -	5	8	- -	2	- -	1
	$24,106	$198,411	- -	- -	$15,137	$11,152	- -	$20,355	- -	$5,777

Note: Chart includes members eligible for supplemental benefits based on prior supplemental computation pay but with zero excess supplemental computation pay in 2017.

EXHIBIT C – RECONCILIATION OF MEMBER DATA

	Active Members	Inactive Vested Members	Retired Members	Beneficiaries	Total
Number as of January 1, 2017	**47**	**0**	**100**	**28**	**175**
• New members	9	N/A	N/A	N/A	9
• Terminations – with vested rights	-1	1	0	0	0
• Terminations – without vested rights	0	N/A	N/A	N/A	0
• Retirements	-11	0	11	N/A	0
• Return to work	0	0	0	N/A	0
• Deceased	0	0	-2	-1	-3
• New beneficiaries	0	0	0	3	3
• Certain period expired	N/A	N/A	0	0	0
• Data adjustments	0	0	1	0	1
Number as of January 1, 2018	**44**	**1**	**110**	**30**	**185**

EXHIBIT D – SUMMARY STATEMENT OF INCOME AND EXPENSES ON A MARKET VALUE BASIS

	Year Ended December 31, 2017		Year Ended December 31, 2016	
Net assets at market value at the beginning of the year[1,3]		$17,663,539		$19,456,706
Contribution income:				
• Employer contributions	$2,077,059		$2,985,478	
• Member contributions	66,095		34,612	
• Less administrative expenses	-68,528		-78,047	
Net contribution income		*$2,074,626*		*$2,942,043*
Investment income:				
• Interest, dividends and other income	$280,393		$451,851	
• Asset appreciation	535,462		857,796	
• Less interest expense	-10,839		-37,264	
• Adjustment to beginning of year value[2]	6,788		0	
• Less investment fees	-76,449		-96,060	
Net investment income		*$735,567*		*$1,176,323*
Total income available for benefits		**$2,810,193**		**$4,118,366**
Less benefit payments		-$2,668,579		-$5,911,533
Change in market value of assets		**$141,614**		**-$1,793,167**
Net assets at market value at the end of the year[1,3]		**$17,805,153**		**$17,663,539**

[1]Based on preliminary unaudited assets

[2]Adjustment from draft financial statement used in the prior valuation to the final audited statements

[3]Unaudited assets were used for the January 1, 2017 actuarial valuation. When the audited financial statements were completed, there were updates to the employer contribution and investment return amounts, resulting in a revision to the market value of assets. Thus, the amounts shown above as of December 31, 2016 differ from the System's and City's Comprehensive Annual Financial Reports. The differences are immaterial to the System's actuarial results.

EXHIBIT E – SUMMARY STATEMENT OF PLAN ASSETS

	December 31, 2017	December 31, 2016
Cash equivalents and prepaid expenses	$999,789	$2,668,669
Invested securities lending collateral	$102,083	$176,730
Capital assets	$106,808	$98,198
Total accounts receivable	$269,604	$227,216
Investments:		
• Real assets	$6,730,133	$9,202,606
• Equity securities	3,948,680	1,261,240
• Fixed income securities	2,755,315	2,200,932
• Private equity	1,865,692	2,156,553
• Alternative investments	1,217,387	1,100,092
• Other	203,850	56,000
Total investments at market value	$16,721,057	$15,977,423
Total assets	$18,199,341	$19,148,236
Total accounts payable	-394,188	-1,484,697
Net assets at market value[1]	**$17,805,153**	**$17,663,539**
Net assets at actuarial value	**$17,805,153**	**$17,663,539**

[1]Unaudited assets were used for the January 1, 2017 actuarial valuation. When the audited financial statements were completed, there were updates to the employer contribution and investment return amounts, resulting in a revision to the market value of assets. Thus, the amounts shown above as of December 31, 2016 differ from the System's and City's Comprehensive Annual Financial Reports. The differences are immaterial to the System's actuarial results.

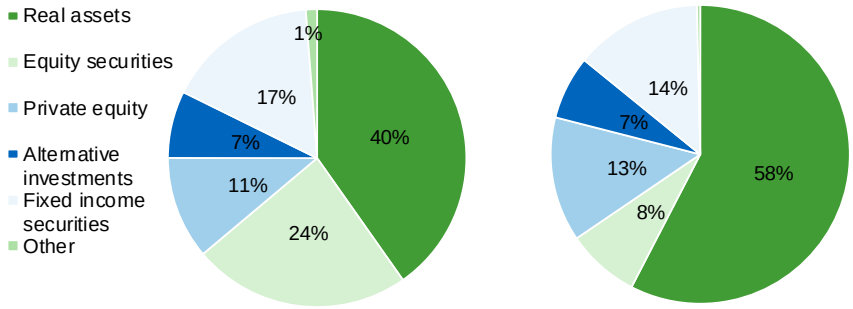


EXHIBIT F – DEVELOPMENT OF THE FUND THROUGH DECEMBER 31, 2017

Year Ended December 31	Employer Contributions	Member Contributions	Net Investment Return[1]	Administrative Expenses[2]	Benefit Payments	Actuarial (Market) Value of Assets at Year-End
2008	$1,243,717	$45,468	-$7,039,494	$0	$1,363,912	$18,139,795
2009	1,343,717	56,261	2,985,884	0	1,844,905	20,680,752
2010	1,443,717	34,355	924,634	0	1,964,422	21,119,036
2011	1,543,717	26,791	252,054	0	2,119,029	20,822,569
2012	1,954,022	26,688	578,432	0	1,819,155	21,562,556
2013	1,935,588	34,039	2,712,000	0	2,207,338	24,036,845
2014	1,817,136	49,104	-1,091,374	0	3,372,841	21,438,870
2015	2,442,790	43,358	-1,828,695	0	2,639,617	19,456,706
2016	2,985,478[3]	34,612	1,176,323	78,047	5,911,533	17,663,539[3]
2017	2,077,059	66,095	735,567	68,528	2,668,579	17,805,153

[1]Net of investment fees and administrative expenses prior to 2016; net of investment fees only beginning in 2016. Returns for years ended 2008-2014 were estimated based on prior actuarial valuations.

[2]Administrative expenses were subtracted from net investment return prior to the 2016 valuation.

[3]Unaudited assets were used for the January 1, 2017 actuarial valuation. When the audited financial statements were completed, there were updates to the employer contribution and investment return amounts, resulting in a revision to the market value of assets. Thus, the amounts shown above as of December 31, 2016 differ from the System's and City's Comprehensive Annual Financial Reports. The differences are immaterial to the System's actuarial results.

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 actuarially determined 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.

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.

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.

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.

Section 4: Actuarial Valuation Basis

EXHIBIT I – ACTUARIAL ASSUMPTIONS AND ACTUARIAL COST METHOD

Rationale for Assumptions:

The information and analysis used in selecting each assumption that has a significant effect on this actuarial valuation is shown in the Experience Study Report for the five-year period ended December 31, 2014, with subsequent changes related to the plan changes and modifications based on the Meet and Confer Agreement.

Net Investment Return:

7.25%

The net investment return assumption was chosen by the Pension System's Board of Trustees, with input from the actuary. This 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 System's target asset allocation.

Salary Scale:

For 2018-2019

2018 – 5% if less than 10 years, 2% if more than 10 years

2019 – 10% if less than 10 years, 7% if 10 – 11 years, 2% if more than 11 years

For 2020 and After

Years of Service	Rate (%)	
	Police	Fire
1	5.20	5.20
2	5.00	5.05
3	4.80	4.90
4	4.60	4.75
5	4.40	4.60
6	4.20	4.45
7	4.00	4.30
8	3.80	4.15
9	3.60	4.00
10	3.40	3.85
11	3.20	3.70
12	3.00	3.55
13	3.00	3.40
14	3.00	3.25
15	3.00	3.10
16 & over	3.00	3.00

Rates above include allowance for inflation of 2.75% per year.

The salary scale assumption is based on the City's pay plan, along with analysis completed in conjunction with an Experience Study Report for the five-year period ended December 31, 2014. The salary scale for 2018-2019 is based on the Meet and Confer Agreement.

Payroll Growth:

2.75%, used to amortize the unfunded actuarial accrued liability as a level percentage of payroll.

Cost-of-Living Adjustments:	
Prior to October 1, 2053	0.00%
Beginning October 1, 2053	2.00%, on original benefit The assumption for the year the COLA begins will be updated on an annual basis and set equal to the year the System is projected to be 70% funded on a market value basis after the COLA is reflected.
Mortality Rates:	
Pre-retirement:	RP-2014 Employee Mortality Table, set back two years for males, projected generationally using Scale MP-2015
Healthy annuitants:	RP-2014 Blue Collar Healthy Annuitant Mortality Table, set forward two years for females, projected generationally using Scale MP-2015
Disabled annuitants:	RP-2014 Disabled Retiree Mortality Table, set back three years for males and females, projected generationally using Scale MP-2015
	The tables above, with adjustments as shown, reasonably reflect the mortality experience of the System as of the measurement date. The mortality tables were then generationally projected using Scale MP-2015 to anticipate future mortality improvement.

Mortality and Disability Rates Before Retirement:

	Rate (%)			
	Mortality[1]		Disability[2]	
Age	Male	Female	Male	Female
20	0.03	0.02	0.010	0.010
25	0.05	0.02	0.015	0.015
30	0.04	0.02	0.020	0.020
35	0.05	0.03	0.025	0.025
40	0.06	0.04	0.030	0.030
45	0.08	0.07	0.035	0.035
50	0.14	0.11	0.040	0.040
55	0.23	0.17	--	--
60	0.38	0.24	--	--
65	1.26	1.05	--	--
70	1.97	1.70	--	--
75	3.15	2.81	--	--
80	5.19	4.71	--	--

[1]Rates shown do not include generational projection; rates beginning at age 65 are for healthy annuitants
[2]100% of disabilities are assumed to be service-related

Withdrawal Rates Before Retirement:

Years of Service	Rate (%)	
	Police	Fire
0	14.00	5.50
1	6.00	4.50
2	5.50	4.00
3	5.00	3.50
4	4.50	3.00
5	4.00	1.50
6	3.50	1.00
7	3.00	0.75
8	2.50	0.50
9	2.00	0.50
10-37	1.00	0.50
38 & over	0.00	0.00

Retirement Rates:

DROP Active Members

Police	
Age	Rate (%)
Under 50	1.00
50-52	3.00
53-54	7.00
55	15.00
56-57	20.00
58-64	25.00
65-66	50.00
67	100.00

Fire	
Age	Rate (%)
Under 50	0.75
50-54	2.50
55-58	12.00
59-64	25.00
65-66	30.00
67	100.00

If at least eight years in DROP as of January 1, 2017, 100% retirement rate in 2018
If less than eight years in DROP as of January 1, 2017, 50% retirement rate in 2018

Retirement Rates (continued):

Non-DROP Active Members

Members hired prior to March 1, 2011 with less than 20 years of service as of September 1, 2017		Members hired prior to March 1, 2011 with at least 20 years of service as of September 1, 2017		Members hired on or after March 1, 2011	
Age	Rate (%)	Age	Rate (%)	Age	Rate (%)
Under 50	0	Under 50	1	Under 50	1
50	10	50	20	50	5
51	5	51	10	51	5
52	5	52	10	52	5
53	5	53	10	53	5
54	5	54	20	54	10
55	15	55	40	55	20
56	10	56	50	56	30
57	5	57	50	57	40
58	60	58	60	58	50
59	50	59	60	59	50
60	50	60	60	60	50
61	50	61	60	61	50
62 & over	100	62 & over	100	62 & over	100

100% retirement rate once the sum of age plus service equals 90

Weighted Average Retirement Age:

Age 55, 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, 2018 actuarial valuation.

Retirement Rates for Inactive Vested Participants:

Current terminated vested members are assumed to retire at age 50

Future terminated vested members are assumed to retire at age 58

Interest on DROP Accounts:	3.00% on account balances as of September 1, 2017, payable upon retirement 0.0% on account balances accrued after September 1, 2017
DROP Utilization:	0% of Police and Fire members are assumed to elect to enter the DROP
DROP Payment Period:	Based on expected lifetime as of the later of September 1, 2017 or retirement date. Expected lifetime determined based on an 85%/15% male/female blend of the current healthy annuitant mortality tables.
DROP Annuitization Interest:	3.00%. Based on United States Department of Commerce Daily Treasury Yield Curve Rates for durations between 5 and 30 years.
Unknown Data for Participants:	Same age and service as those exhibited by members with similar known characteristics. If not specified, members are assumed to be male.
Family Composition:	75% of participants are assumed to be married. Females are assumed to be three years younger than males. The youngest child is assumed to be ten years old.
Benefit Election:	Married participants are assumed to elect the Joint and Survivor annuity form of payment and non-married participants are assumed to elect a Life Only annuity.
Administrative Expenses:	$65,000 per year, payable monthly (equivalent to $62,765 at the beginning of the year)
Actuarial Value of Assets:	Market value of assets
Actuarial Cost Method:	Entry Age Normal Actuarial Cost Method. Entry Age is the age at the time the member commenced employment. Normal Cost and Actuarial Accrued Liability are calculated on an individual basis, with Normal Cost determined as if the current benefit accrual rate had always been in effect. Actuarial Liability is allocated by salary.
Amortization Methodology	The actuarially determined contribution is calculated using a rolling 10-year amortization of unfunded actuarially accrued liability.
Justification for Change in Actuarial Assumptions:	The following assumptions were updated with this valuation: ➢ The administrative expense assumption was changed from $60,000 per year to $65,000 per year. ➢ Interest payable upon retirement on DROP account balances as of September 1, 2017 increased from 2.75% to 3.00%. ➢ Annual 2.00% COLAs are assumed to be payable beginning October 1, 2053, based on an updated projection of unfunded actuarial accrued liability. In the prior valuation these COLAs were assumed to begin October 1, 2049.

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.

MEMBERS WHOSE PARTICIPATION BEGAN BEFORE MARCH 1, 2011

Plan Year:	January 1 through December 31
Plan Status:	Ongoing
Normal Retirement:	
Benefit Earned Prior to September 1, 2017	
Age Requirement	50
Service Requirement	5
Amount	The greater of 3% of Average Supplemental Computation Pay times years of Pension Service (maximum 96.0%).
Average Supplemental Computation Pay	Supplemental Computation Pay is the current rate of pay received by the member, minus the rate of pay the member would receive for the highest civil service rank the member held. Average Supplemental Computation Pay is determined based on the highest 36 consecutive months of Supplemental Computation Pay.
Benefit Earned Beginning September 1, 2017	
Age Requirement	58
Service Requirement	5
Amount	The greater of 2.5% of Average Supplemental Computation Pay times years of Pension Service (maximum 90.0%).
Average Supplemental Computation Pay	Supplemental Computation Pay is the current rate of pay received by the member, minus the rate of pay the member would receive for the highest civil service rank the member held. Average Supplemental Computation Pay is determined based on the highest 60 consecutive months of Supplemental Computation Pay.

20 and Out Reduced Retirement:

If Eligible as of September 1, 2017

Age Requirement

None

Service Requirement

20 years

Amount

20 & Out Multiplier times 36-month (Table 1 Benefit) or 60-month (Table 2 Benefit) Average Supplemental Computation Pay times years of Pension Service

Benefit Accrued by September 1, 2017 20 & Out Table 1		Benefit Accrued by September 1, 2017 20 & Out Table 2	
Age	20 & Out Multiplier	Age	20 & Out Multiplier
45 & under	2.00%	53 & under	2.00%
46	2.25%	54	2.10%
47	2.50%	55	2.20%
48	2.75%	56	2.30%
49	2.75%	57	2.40%
50 & above	3.00%	58 & above	2.50%

If Not Eligible as of September 1, 2017

Age Requirement

None

Service Requirement

20 years

Amount

20 & Out Multiplier times 60-month Average Supplemental Computation Pay times years of Pension Service

20 & Out Table 2	
Age	20 & Out Multiplier
53 & under	2.00%
54	2.10%
55	2.20%
56	2.30%
57	2.40%
58 & above	2.50%

Early Retirement:	
If at least age 45 as of September 1, 2017 and less than age 50	
Age Requirement	45
Service Requirement	5
Amount	Normal pension accrued prior to September 1, 2017 plus the benefit accrued based on the 20 & Out Table 2 for service beginning September 1, 2017, reduced by 2/3 of 1% for each whole month by which the benefit commencement date precedes age 50.
Non-Service Connected Disability:	
Eligibility	Injury or illness (lasting more than 90 days) not related to or incurred while in the performance of the member's job, preventing the member from performing their departmental duties.
Amount	3% of Average Computation Pay for service earned prior to September 1, 2017 and the applicable benefit multiplier from 20 & Out Table 2 times Average Supplemental Computation Pay for service earned beginning September 1, 2017
Service-Connected Disability:	
Eligibility	Injury or illness (lasting more than 90 days) obtained while on duty in the performance of the member's job.
Amount	3% of Average Computation Pay for service earned prior to September 1, 2017 and the applicable benefit multiplier from 20 & Out Table 2 times Average Supplemental Computation Pay for service earned beginning September 1, 2017; if the member has less than 20 years of service, the benefit will be calculated as if they had 20 years at the time of disability.
Benefit Supplement:	
Age Requirement	55
Service Requirement	20 years, waived if member is receiving a service-connected disability
Amount	3% of the total monthly benefit (including any applicable COLAs) payable to the Member when the Member attains age 55. The benefit supplement shall not be less than $75 per month. Beginning September 1, 2017, only those annuitants already receiving the supplement will be eligible to maintain their current supplement, which will not change ongoing; no additional retirees will be eligible for the supplement.
Termination Benefit:	
With less than five years of pension service	Upon request, the member's contributions will be returned without interest.
With at least five years of pension service	The member may either withdraw contributions or leave contributions in the Plan and receive a monthly benefit to commence no earlier than the member's earliest eligibility for retirement benefits. Retirement benefit is equal to the accrued benefit as of the date of termination.

Pre-Retirement Death Benefit:	
While in active service	The greater of 50% of the Member's accrued benefit or a benefit based on 20 years of service. The benefit may not exceed 45% of Average Supplemental Computation Pay.
After leaving active service, with fewer than five years	A lump sum benefit equal to the return of member contributions with interest.
After leaving active service, with at least five years	50% of the Member's accrued benefit, with no early retirement reduction, or a refund of member contributions
Post-Retirement Death Benefit:	50% of the pension the Member was receiving at the time of their death.
Qualified Surviving Children Benefit:	50% of the pension the Member was receiving at the time of their death, divided equally among the children, paid until the youngest child is 19 years old or for life if the child becomes handicapped prior to age 23
Special Survivor Benefit:	
Eligibility	Upon leaving active service or joining DROP: a) the Member was at least 55 years old with at least 20 years of pension service, or b) the sum of the Member's age plus Pension Service was at least 78; **and** Has no Qualified Surviving Children or handicapped children currently eligible for survivor benefits; **and** Whose Qualified Surviving Spouse is at least 55 years old. The Qualified Surviving Spouse does not have to be 55 years old at the time of the Member's death.
Amount	Once all the eligibility conditions are met, the amount the Qualified Surviving Spouse will receive increases from 50% of the Member's pension benefit to a percentage of the Member's pension benefit based on 3% times the number of years of Pension Service the Member worked.
Survivor Benefit if No Qualified Surviving Spouse:	A lump sum that is the actuarial equivalent of 120 monthly payments of the greater of: 50% of the Member's pension benefit at the time of their death, or a benefit based on 20 years of the Member's service.

DROP:	
Eligibility	Members in active service who are retirement eligible may elect to enter the Deferred Retirement Option Plan (DROP).
Distribution	The DROP account balance will be paid over the expected future lifetime of annuitants.
Interest	Based on United States Department of Commerce Daily Treasury Yield Curve Rates for durations between 5 and 30 years; interest rate is based on the expected lifetime of the members at the time they retire.
Cost of Living:	The Board may grant an ad hoc COLA based on the actual market return over the prior five years less 5%, not to exceed 4% of the base benefit, if, after granting a COLA, the funded ratio on a market value of assets basis is no less than 70%.
Member Contributions:	13.5% of supplemental computation pay for all members
City Contributions:	The City will contribute the Actuarially Determined Employer Contribution based on a 10-year rolling amortization period.
Optional Forms of Benefits:	Life Annuity with 36 months guaranteed; 50% or 75% Husband-and-Wife Pension with Pop-Up; 66-2/3% or 100% Joint and Survivor Pension.
Changes in Plan Provisions:	Active members who elected to enter DROP prior to June 1, 2017 were eligible to revoke the DROP election during the period September 1, 2017 through February 28, 2018.

MEMBERS WHOSE PARTICIPATION BEGAN ON OR AFTER MARCH 1, 2011

Normal Retirement:	
Age Requirement	58
Service Requirement	5
Amount	2.5% of Average Supplemental Computation Pay for each year of Pension Service, maximum 90%
Average Supplemental Computation Pay	Supplemental Computation Pay is the current rate of pay received by the member, minus the rate of pay the member would receive for the highest civil service rank the member held. Average Supplemental Computation Pay is determined based on the highest 60 consecutive months of Supplemental Computation Pay
Early Retirement:	
Age Requirement	53
Service Requirement	5
Amount	Normal pension accrued, reduced by 2/3 of 1% for each whole month by which the benefit commencement date precedes the normal retirement date.
20 and Out Reduced Retirement:	
Requirement	None
Service Requirement	20 years
Amount	20 & Out Multiplier times Average Supplemental Computation Pay times years of Pension Service

20 & Out Table 2

Age	20 & Out Multiplier
53 & under	2.00%
54	2.10%
55	2.20%
56	2.30%
57	2.40%
58 & above	2.50%

Non-Service Connected Disability:	
Eligibility	Injury or illness (lasting more than 90 days) not related to or incurred while in the performance of the member's job, preventing the member from performing their departmental duties.
Amount	The Member's accrued benefit, but not less than a pro-rated minimum benefit.
Service-Connected Disability:	
Eligibility	Injury or illness (lasting more than 90 days) obtained while on duty in the performance of the member's job.
Amount	The greater of 50% of Average Supplemental Computation Pay and the Member's accrued benefit.
Termination Benefit:	
With less than five years of service	Upon request, the member's contributions will be returned without interest.
With at least five years of service	The member may either withdraw contributions or leave contributions in the Plan and receive a monthly benefit to commence no earlier than the member's earliest eligibility for retirement benefits. Retirement benefit is equal to the accrued benefit as of the date of termination.
Pre-Retirement Death Benefit:	
While in active service	The greater of 50% of the Member's accrued benefit or a benefit based on 20 years of service. The benefit may not exceed 45% of Average Supplemental Computation Pay.
After leaving active service, with less than five years	A lump sum benefit equal to the return of member contributions with interest.
After leaving active service, with at least five years	50% of the Member's accrued benefit, with no early retirement reduction, or a refund of member contributions
Post-Retirement Death Benefit:	50% of the pension the Member was receiving at the time of their death.
Qualified Surviving Children Benefit:	50% of the pension the Member was receiving at the time of their death, divided equally among the children, paid until the youngest child is 19 years old or for life if the child becomes handicapped prior to age 23
Special Survivor Benefit:	
Eligibility	Upon leaving active service or joining DROP: a) the Member was at least 55 years old with at least 20 years of pension service, or b) the sum of the Member's age plus Pension Service was at least 78; **and** Has no Qualified Surviving Children or handicapped children currently eligible for survivor benefits; **and** Whose Qualified Surviving Spouse is at least 55 years old. The Qualified Surviving Spouse does not have to be 55 years old at the time of the Member's death.
Amount	Once all the eligibility conditions are met, the amount the Qualified Surviving Spouse will receive increases from 50% of the Member's pension benefit to a percentage of the Member's pension benefit based on the Member's applicable benefit multiplier times the number of years of Pension Service the Member worked.

Survivor Benefit if No Qualified Surviving Spouse:	A lump sum that is the actuarial equivalent of 120 monthly payments of the greater of: 50% of the Member's pension benefit at the time of their death, or a benefit based on 20 years of the Member's service.
DROP:	
Eligibility	Members in active service who are retirement eligible may elect to enter the Deferred Retirement Option Plan (DROP).
Distribution	The DROP account balance will be paid over the expected future lifetime of annuitants.
Interest	Based on United States Department of Commerce Daily Treasury Yield Curve Rates for durations between 5 and 30 years; interest rate is based on the expected lifetime of the members at the time they retire.
Cost of Living:	The Board may grant an ad hoc COLA based on the actual market return over the prior five years less 5%, not to exceed 4% of the base benefit, if, after granting a COLA, the funded ratio on a market value of assets basis is no less than 70%.
Member Contributions:	13.5% of supplemental computation pay for all members
City Contributions:	The City will contribute the Actuarially Determined Employer Contribution based on a 10-year rolling amortization period.
Optional Forms of Benefits:	Life Annuity with 36 months guaranteed; 50% or 75% Husband-and-Wife Pension with Pop-Up; 66-2/3% or 100% Joint and Survivor Pension.
Changes in Plan Provisions:	Active DROP members who entered the DROP prior to June 1, 2017 were eligible to revoke the DROP election during the period from September 1, 2017 through February 28, 2018.

Section 5: GASB Information

EXHIBIT 1 – NET PENSION LIABILITY

The components of the net pension liability at December 31, 2017 were as follows:

Total pension liability	$33,670,180
Plan fiduciary net position	17,805,153
Net pension liability	15,865,027
Plan fiduciary net position as a percentage of the total pension liability	52.88%

The December 31, 2017 Total Pension Liability does not include the plan provision allowing members who entered DROP before June 1, 2017 to revoke the DROP election during the period from September 1, 2017 through February 28, 2018, since the election window closed after the measurement date.

Actuarial assumptions. The total pension liability was determined by an actuarial valuation as of January 1, 2018, using the following actuarial assumptions, applied to all periods included in the measurement:

Inflation	2.75%
Real rate of return	4.50%
Investment rate of return	7.25%, net of pension plan investment expense, including inflation

The actuarial assumptions used in the January 1, 2018 valuation were based on the results of an experience study for the period January 1, 2010 to December 31, 2014, plus assumption changes included in the January 1, 2017 and January 1, 2018 valuations. Assumptions are detailed in Section 4, Exhibit I of this report.

The long-term expected rate of return on pension plan investments was determined using a building-block method in which best-estimate ranges of expected future real rates of return (expected returns, net of pension plan investment expense and inflation) are developed for each major asset class. These ranges are combined to produce the long-term expected rate of return by weighting the expected future real rates of return by the target asset allocation percentage and by adding expected inflation. Best estimates of arithmetic real rates of return for each major asset class included in the pension plan's target asset allocation as of December 31, 2017 are summarized in the table on the following page.

Asset Class	Target Allocation	Long-Term Expected Real Rate of Return[1]
Global Equity	20%	6.54%
Emerging Market Equity	5%	9.41%
Private Equity	5%	10.28%
Short-Term Core Bongs	2%	1.25%
Global Bonds	3%	1.63%
High Yield	5%	4.13%
Bank Loans	6%	3.46%
Structured Credit and Absolute Return	6%	5.38%
Emerging Markets Debt	6%	4.42%
Private Debt	5%	7.30%
Natural Resources	5%	7.62%
Infrastructure	5%	6.25%
Real Estate	12%	4.90%
Liquid Real Assets	3%	4.71%
Asset Allocation	10%	4.90%
Cash	2%	1.06%
Total	100%	

[1]As provided by Segal Marco Advisors, a member of The Segal Group. The real rates of return are net of inflation.

Discount rate: The discount rate used to measure the total pension liability was 7.25%. The projection of cash flows used to determine the discount rate assume that City contributions will equal the employer's normal cost plus a ten-year amortization payment on the unfunded actuarial accrued liability and member contributions will equal 13.50% of supplemental computation pay. Based on those assumptions, the System's fiduciary net position was projected to be available to make all projected future benefit payments of current plan members. Therefore, the long-term expected rate of return on pension plan investments was applied to all periods of projected benefit payments to determine the total pension liability.

Actuarial cost method: In accordance with GASB 67, the Total Pension Liability for active members is valued as the total present value of benefits once they enter the DROP. For the funding valuation, the liability for these members accumulates from their entry age until they are assumed to leave active service.

Sensitivity of the net pension liability to changes in the discount rate. The following presents the net pension liability, calculated using the discount rate of 7.25%, as well as what the net pension liability would be if it were calculated using a discount rate that is one percentage-point lower (6.25%) or one percentage-point higher (8.25%) than the current rate:

	1% Decrease (6.25%)	Current Discount (7.25%)	1% Increase (8.25%)
Net pension liability	$18,826,159	$15,865,027	$13,316,450

EXHIBIT 2 – SCHEDULE OF CHANGES IN NET PENSION LIABILITY

	2017	2016
Total pension liability		
• Service cost	$111,485	$70,220
• Interest	2,799,166	2,910,845
• Change of benefit terms	-5,305,618	0
• Differences between expected and actual experience	-1,434,786	1,105,788
• Changes of assumptions	-479,159	-916,752
• Benefit payments, including refunds of employee contributions	-2,668,579	-5,911,533
Net change in total pension liability	**-$6,977,491**	**-$2,741,432**
Total pension liability – beginning	**40,647,671**	**43,389,103**
Total pension liability – ending (a)	**$33,670,180**	**$40,647,671**
Plan fiduciary net position		
• Contributions – employer	$2,077,059	$3,063,584
• Contributions – employee	66,095	34,612
• Net investment income	739,618	1,142,269
• Benefit payments, including refunds of employee contributions	-2,668,579	-5,911,533
• Interest expense	-68,528	-78,047
• Other	-10,839	-37,264
Net change in plan fiduciary net position	**$134,826**	**-$1,786,379**
Plan fiduciary net position – beginning	**17,670,327**	**19,456,706**
Plan fiduciary net position – ending (b)	**$17,805,153**	**$17,670,327**
Net pension liability – ending (a) – (b)	**$15,865,027**	**$22,977,344**
Plan fiduciary net position as a percentage of the total pension liability	**52.88%**	**43.47%**
Covered employee payroll	**$916,199**	**$525,048**
Net pension liability as percentage of covered employee payroll	**1,731.61%**	**4,376,24%**

Notes to Schedule:

Benefit changes: Plan changes effective September 1, 2017 that were signed into law May 31, 2017 as HB 3158 are reflected for the first time in the December 31, 2017 total pension liability, along with assumption changes that were implemented as part of the plan changes. These changes are summarized in Section 1 of the January 1, 2017 actuarial valuation, except that the COLA start date has been updated from October 1, 2049 to October 1, 2053 and the interest rate for the annuitization of DROP balances upon retirement has been updated from 2.75% to 3.00%.

Change of Assumptions: The blended discount rate increased from 7.19% to 7.10% as of December 31, 2016, and from 7.10% to 7.25% as of December 31, 2017. The assumption changes in 2016 also included updates to the salary scale to reflect the Meet and Confer Agreement, and a change to the expected DROP interest payable.

EXHIBIT 3 – SCHEDULE OF EMPLOYER CONTRIBUTIONS

Year Ended December 31	Actuarially Determined Contributions	Contributions in Relation to the Actuarially Determined Contributions	Contribution Deficiency (Excess)	Covered-Employee Payroll	Contributions as a Percentage of Covered Employee Payroll
2015	$2,442,790	$2,442,790	$0	$556,725	438.78%
2016	3,063,584	3,063,584	0	724,503	422.85%
2017	2,086,639	2,077,059	9,580	525,048	395.59%

The contribution deficiency for calendar year 2017 represents contributions directed to the Excess Benefit Plan and Trust.

Notes to Schedule:

Methods and assumptions used to determine contribution rates for the year ended December 31, 2017:

Valuation date	Actuarially determined contribution is calculated as of January 1, 2017, the beginning of the fiscal year in which contributions are reported
Actuarial cost method	Entry age
Amortization method	10-year level percent of payroll, using 2.75% annual increases
Remaining amortization period	10 years, open
Asset valuation method	Market value
Investment rate of return	7.25%, including inflation, net of pension plan investment expenses
Inflation rate	2.75%
Projected salary increases	Inflation plus merit increases, varying by group and service
Retirement rates	Group specific rates based on age
Cost of living adjustments:	2.00% simple increases starting October 1, 2049

Mortality:	
Pre-retirement	Sex-distinct RP-2014 Employee Mortality Table, set back two years for males, projected generationally using Scale MP-2015
Healthy annuitant	Sex-distinct RP-2014 Healthy Annuitant Mortality Table, set forward two years for females, projected generationally using Scale MP-2015
Disabled	Sex-distinct RP-2014 Disabled Retiree Mortality Table, set back three years for males and females, projected generationally using Scale MP-2015
Other information	See Section 4 of the January 1, 2017 actuarial valuation for a full outline of assumptions. See Exhibit 2 of this Section for the history of changes to plan provisions and assumptions.
DROP utilization	0% of Police and Fire members are assumed to elect to enter DROP
Interest on DROP Accounts	6.00% per annum, until September 1, 2017 Beginning September 1, 2017: – 2.75% on annuitant account balances – 2.75% payable upon retirement on active account balances as of September 1, 2017 0.00% on active account balances accrued after September 1, 2017

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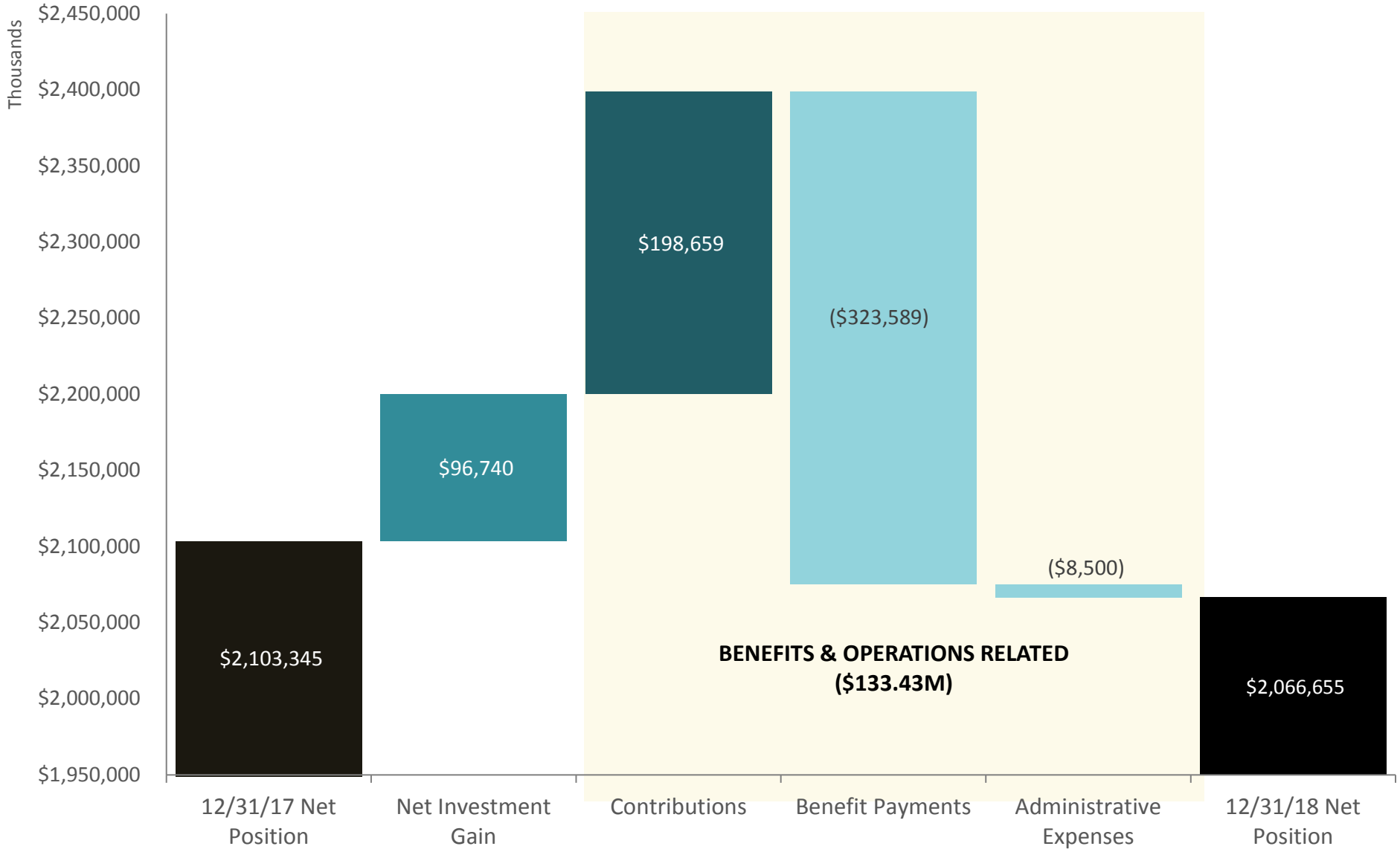
DALLAS POLICE & FIRE PENSION SYSTEM

Projected Change in Net Position Bridge Chart

September 13, 2018

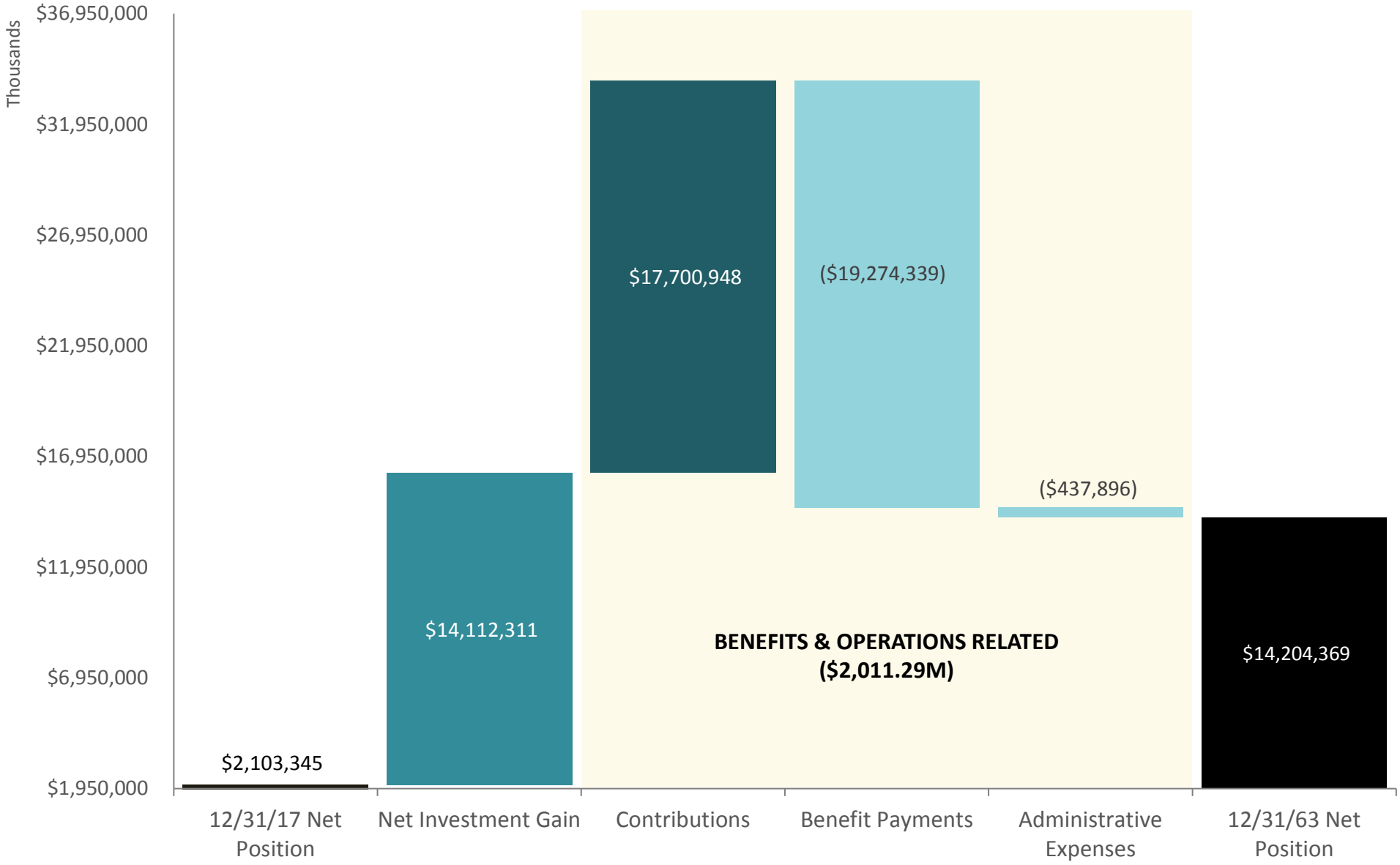
2018 Projected Change in Net Fiduciary Position

December 31, 2017 – December 31, 2018 – Hiring Plan



Projected Change in Net Fiduciary Position – 45 Years

December 31, 2017 – December 31, 2063 – Hiring Plan



Projected Change in Net Fiduciary Position "Bridge Chart" based on 1-1-2018 Actuarial Valuation Data

	Net Position	Investment Related	Benefits & Operations Related			Net Position
Year	Beginning	Net Investment Gain	Contributions	Benefit Payments	Administration Expenses [1]	Ending
2018	2,103,345,471	96,739,940	198,658,953	(323,589,275)	(8,500,000)	2,066,655,089
2019	2,066,655,089	100,045,274	205,845,614	(328,844,819)	(8,500,000)	2,035,201,158
2020	2,035,201,158	103,298,419	215,284,000	(342,008,466)	(8,500,000)	2,003,275,111
2021	2,003,275,111	120,932,830	221,012,000	(349,211,676)	(8,500,000)	1,987,508,265
2022	1,987,508,265	139,144,542	227,088,000	(355,134,394)	(8,500,000)	1,990,106,413
2023	1,990,106,413	139,021,025	223,242,000	(359,892,065)	(8,500,000)	1,983,977,373
2024	1,983,977,373	138,772,161	230,920,000	(362,177,212)	(8,500,000)	1,982,992,322
2025	1,982,992,322	138,438,783	226,080,000	(364,563,720)	(8,500,000)	1,974,447,385
2026	1,974,447,385	138,060,185	234,240,000	(366,077,941)	(8,500,000)	1,972,169,629
2027	1,972,169,629	138,174,149	243,360,000	(367,498,602)	(8,500,000)	1,977,705,176
2028	1,977,705,176	138,836,826	252,000,000	(368,928,932)	(8,500,000)	1,991,113,070
2029	1,991,113,070	140,115,044	261,600,000	(370,083,557)	(8,500,000)	2,014,244,557
2030	2,014,244,557	142,083,819	271,200,000	(371,635,497)	(8,500,000)	2,047,392,879
2031	2,047,392,879	144,657,922	278,880,000	(374,602,393)	(8,500,000)	2,087,828,408
2032	2,087,828,408	147,804,230	286,560,000	(376,358,743)	(8,500,000)	2,137,333,895
2033	2,137,333,895	151,617,252	294,720,000	(378,342,903)	(8,500,000)	2,196,828,244
2034	2,196,828,244	156,206,927	302,880,000	(378,879,882)	(8,500,000)	2,268,535,289
2035	2,268,535,289	161,754,545	311,040,000	(377,416,232)	(8,500,000)	2,355,413,602
2036	2,355,413,602	168,229,609	319,680,000	(381,190,394)	(8,500,000)	2,453,632,817
2037	2,453,632,817	175,525,521	328,320,000	(385,002,298)	(8,500,000)	2,563,976,040

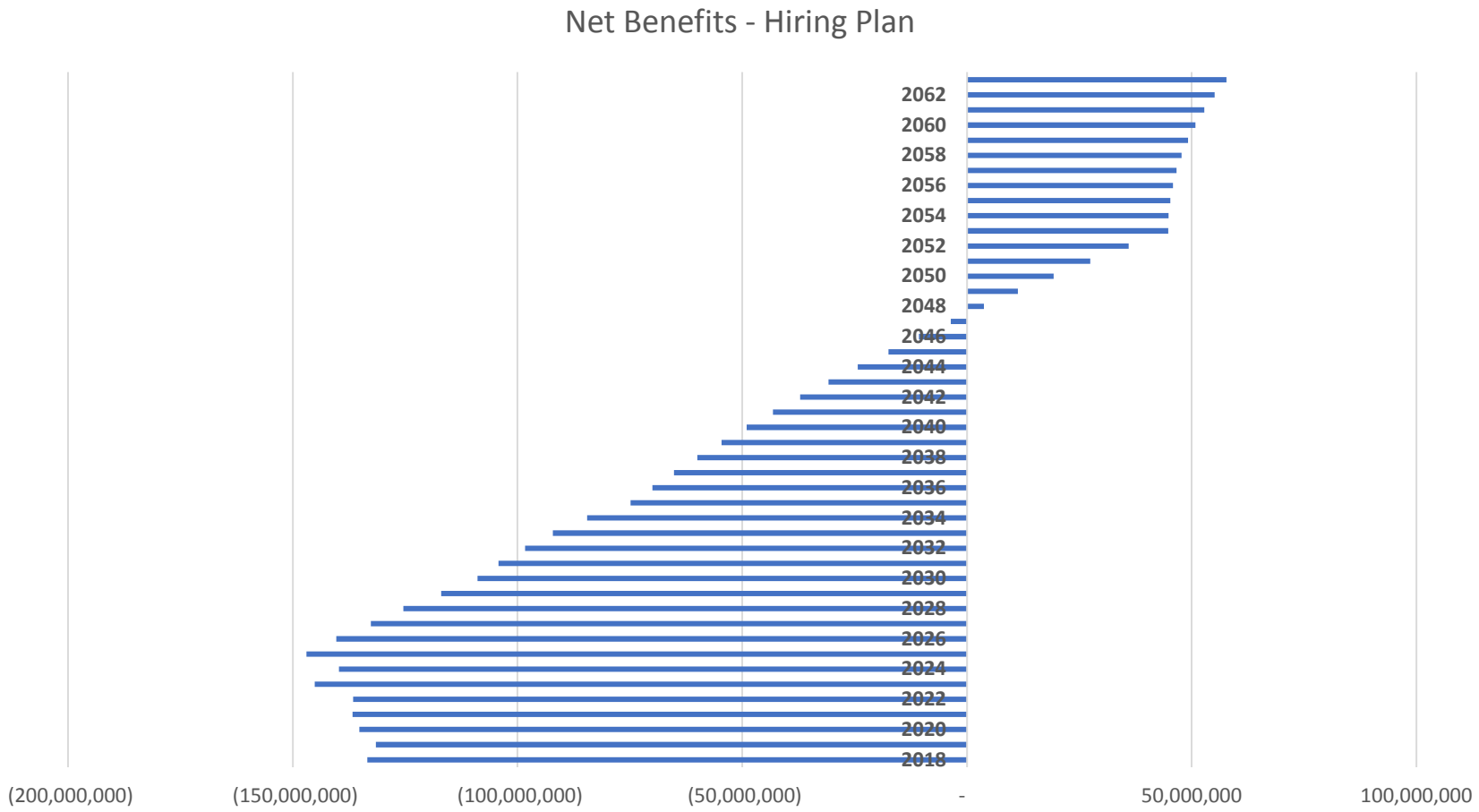
[1] Administration expenses are the greater of $8.5 million or 1% of Computation Pay

Table Continued

Year	Beginning	Net Investment Gain	Contributions	Benefit Payments	Administration Expenses [1]	Ending
2038	**2,563,976,040**	183,713,135	337,348,800	(388,852,321)	(8,500,000)	**2,687,685,655**
2039	**2,687,685,655**	192,877,418	346,625,892	(392,740,844)	(8,500,000)	**2,825,948,121**
2040	**2,825,948,121**	203,104,621	356,158,104	(396,668,253)	(8,500,000)	**2,980,042,592**
2041	**2,980,042,592**	214,487,723	365,952,452	(400,634,935)	(8,500,000)	**3,151,347,832**
2042	**3,151,347,832**	227,126,931	376,016,145	(404,641,285)	(8,500,000)	**3,341,349,623**
2043	**3,341,349,623**	241,130,220	386,356,588	(408,687,698)	(8,500,000)	**3,551,648,734**
2044	**3,551,648,734**	256,613,905	396,981,394	(412,774,575)	(8,500,000)	**3,783,969,458**
2045	**3,783,969,458**	273,703,268	407,898,383	(416,902,320)	(8,500,000)	**4,040,168,790**
2046	**4,040,168,790**	292,524,822	419,115,588	(421,071,344)	(8,731,575)	**4,322,006,280**
2047	**4,322,006,280**	313,214,503	430,641,267	(425,282,057)	(8,971,693)	**4,631,608,301**
2048	**4,631,608,301**	335,926,836	442,483,901	(429,534,878)	(9,218,415)	**4,971,265,746**
2049	**4,971,265,746**	360,828,206	454,652,209	(433,830,226)	(9,471,921)	**5,343,444,014**
2050	**5,343,444,014**	388,097,656	467,155,145	(438,168,529)	(9,732,399)	**5,750,795,887**
2051	**5,750,795,887**	417,927,824	480,001,912	(442,550,214)	(10,000,040)	**6,196,175,369**
2052	**6,196,175,369**	450,525,946	493,201,964	(446,975,716)	(10,275,041)	**6,682,652,522**
2053	**6,682,652,522**	486,114,928	506,765,018	(451,445,473)	(10,557,605)	**7,213,529,391**
2054	**7,213,529,391**	524,607,211	520,701,056	(464,988,837)	(10,847,939)	**7,783,000,882**
2055	**7,783,000,882**	565,906,298	535,020,335	(478,667,635)	(11,146,257)	**8,394,113,623**
2056	**8,394,113,623**	610,233,393	549,733,394	(492,483,221)	(11,452,779)	**9,050,144,410**
2057	**9,050,144,410**	657,826,401	564,851,062	(506,436,963)	(11,767,730)	**9,754,617,180**
2058	**9,754,617,180**	708,941,150	580,384,466	(520,530,242)	(12,091,343)	**10,511,321,211**
2059	**10,511,321,211**	763,852,719	596,345,039	(534,764,454)	(12,423,855)	**11,324,330,661**
2060	**11,324,330,661**	822,856,851	612,744,529	(549,141,008)	(12,765,511)	**12,198,025,521**
2061	**12,198,025,521**	886,271,471	629,595,003	(563,661,327)	(13,116,563)	**13,137,114,105**
2062	**13,137,114,105**	954,438,320	646,908,865	(578,326,850)	(13,477,268)	**14,146,657,172**
2063	**14,146,657,172**	-	664,698,859	(593,139,028)	(13,847,893)	**14,204,369,110**

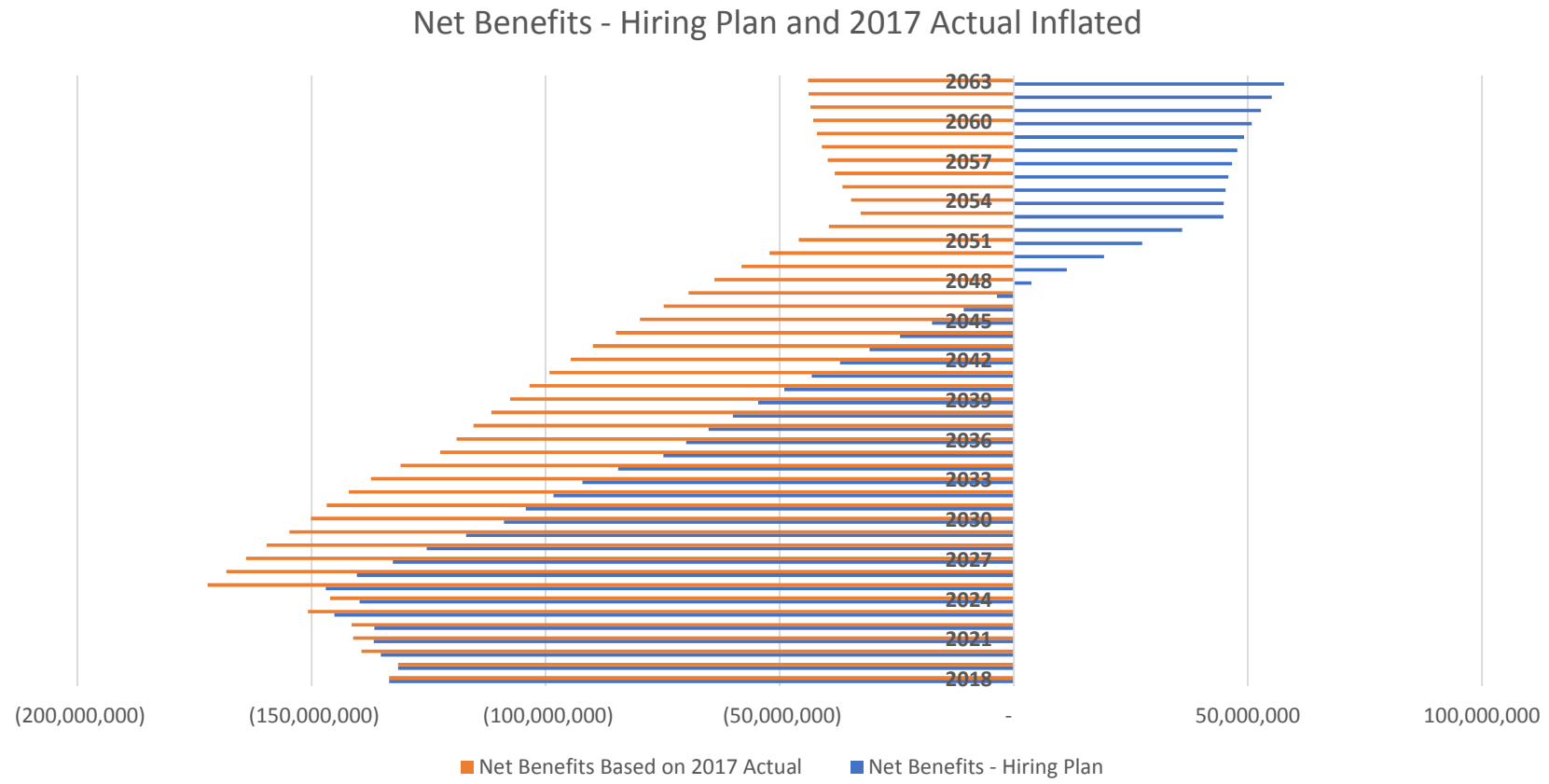
[1] Administration expenses are the greater of $8.5 million or 1% of Computation Pay

Based on the City Hiring Plan - Benefit Payments are projected to Exceed Contributions until 2047



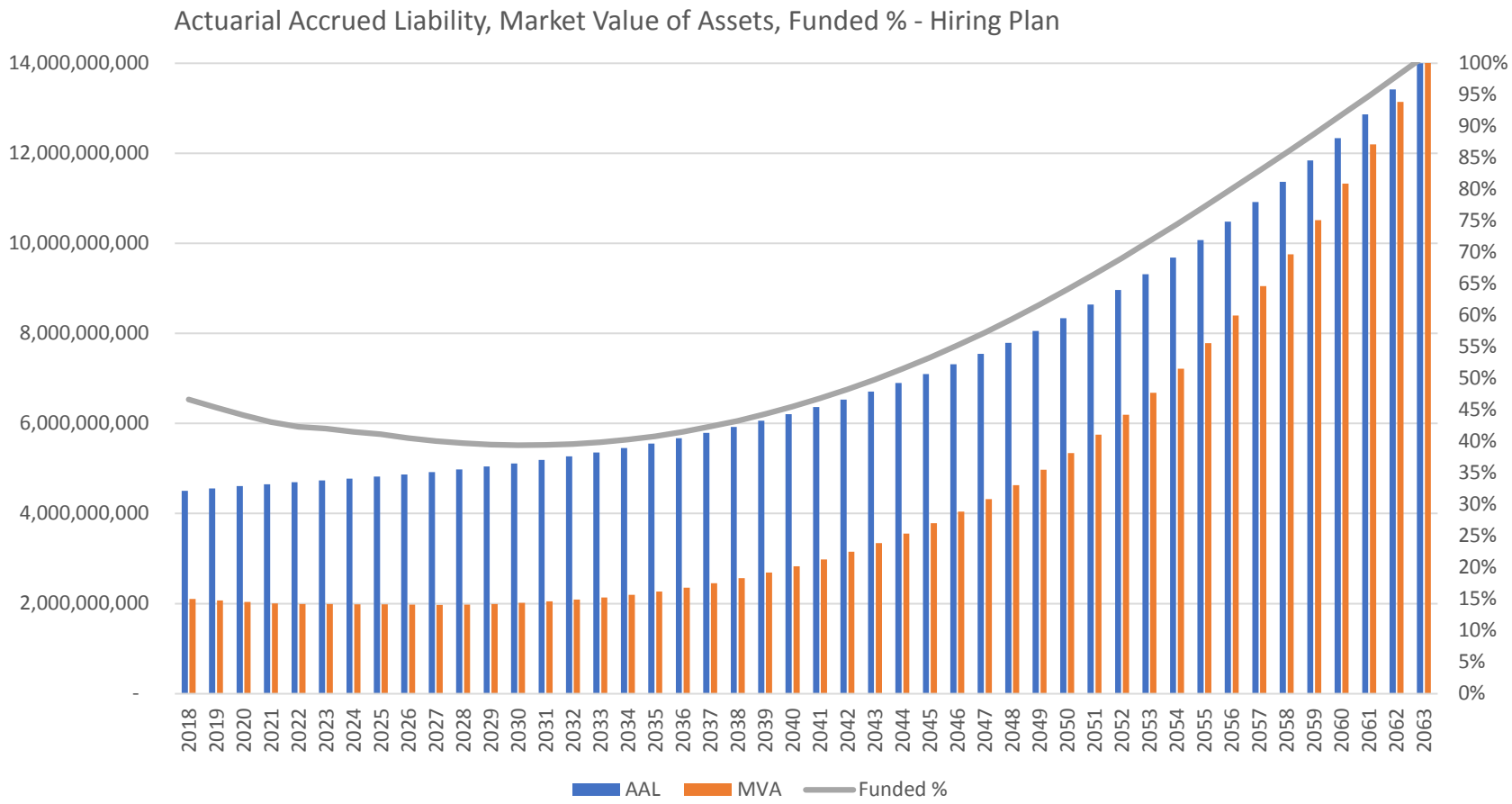
Note: Benefit Payments include administration expenses

Net Benefit Payments Based on the City's Hiring Plan Compared to the Net Benefit Payments using the 1-1-2018 Valuation Payroll Inflated by the Growth Rate Assumption.

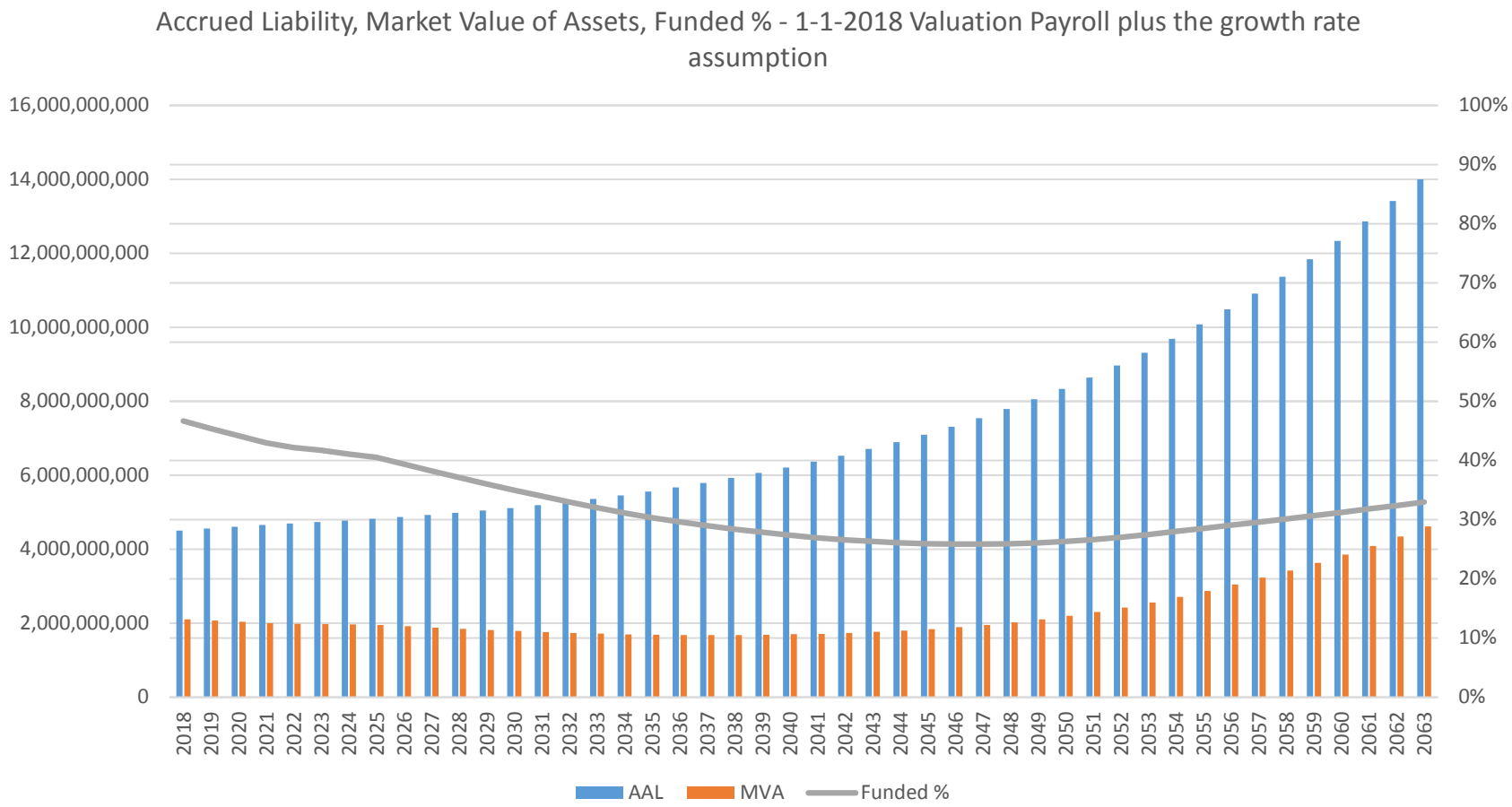


Note: Benefit Payments include administration expenses

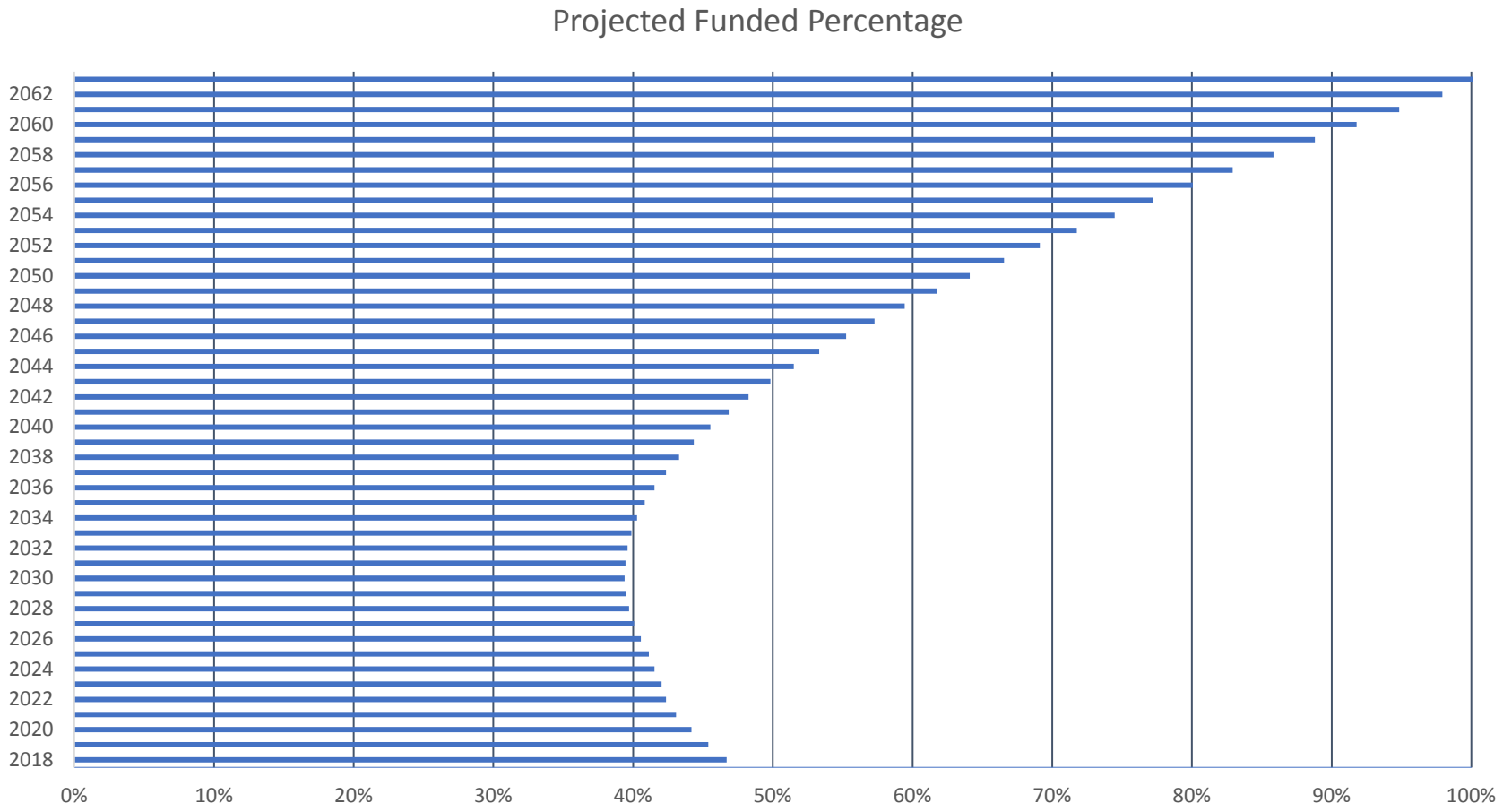
Actuarial Accrued Liability, Market Value of Assets and Funded % Based on City Hiring Plan.



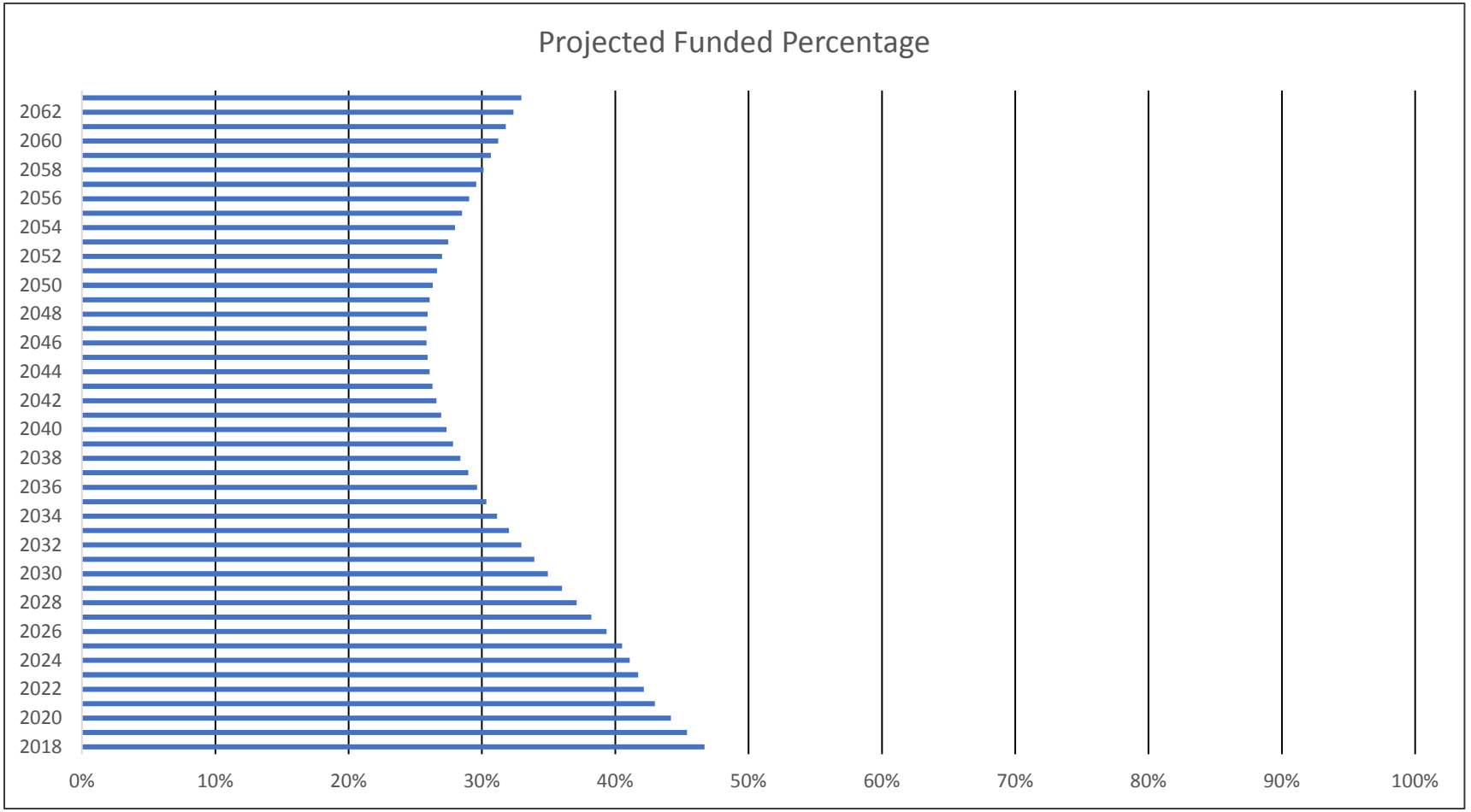
Actuarial Accrued Liability, Market Value of Assets and Funded % Based on 1-1-2018 Valuation Payroll Inflated by the Payroll Growth Rate Assumption



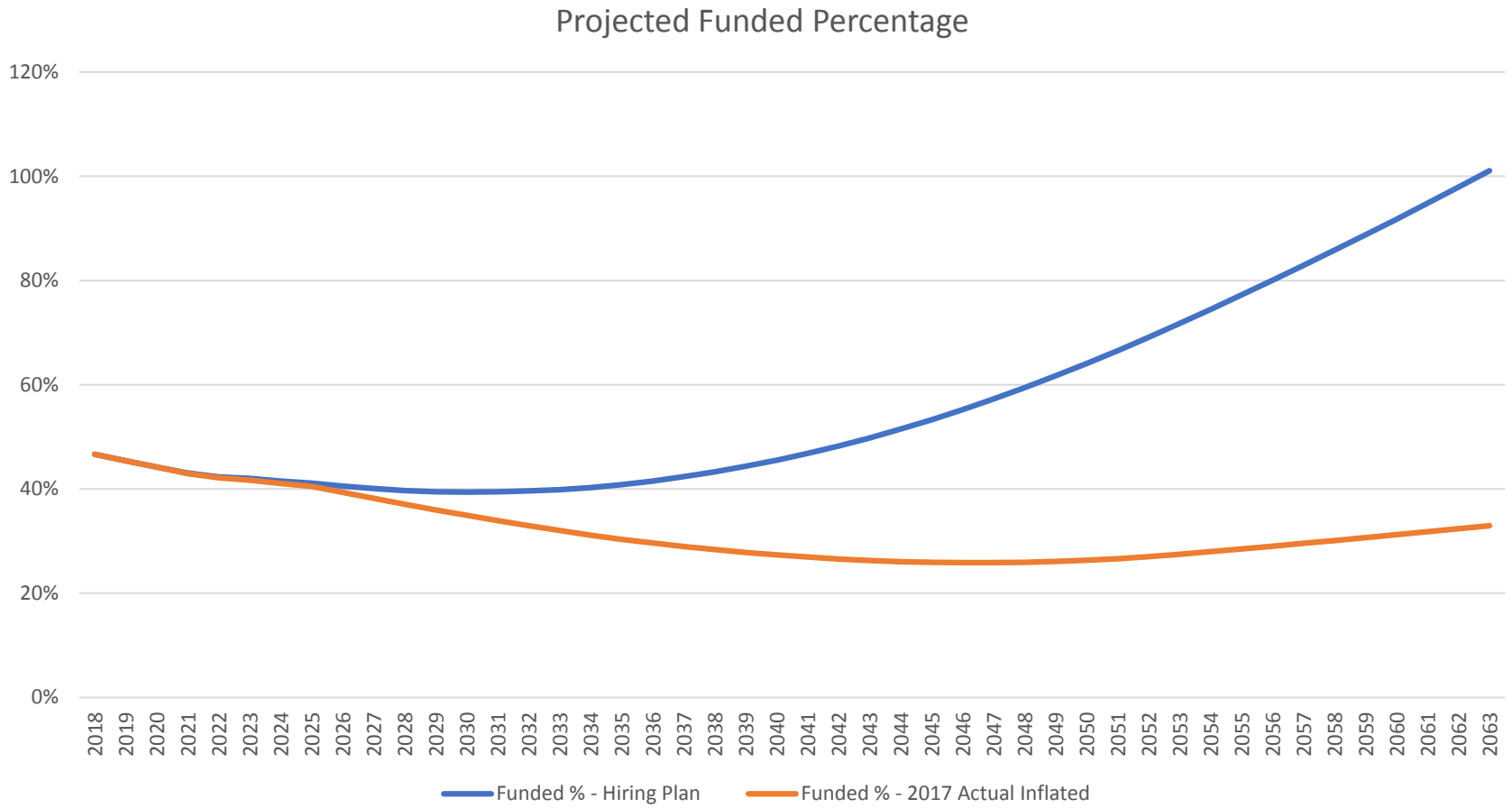
Projected Funded Percentage – City Hiring Plan



Projected Funded Percentage – 1-1-2018 Valuation Payroll Inflated by the Payroll Growth Rate Assumption



Projected Funded Percentage based on the City's Hiring Plan compared to 1-1-2018 Valuation Payroll Inflated by the Payroll Growth Rate Assumption.



Conclusion

- The Projected Change in Net Position Charts and Tables are based on the 1-1-2018 Actuarial Valuation and assumes all assumptions are met.
  - Even if all assumptions are achieved the funding level of the Plan is fragile.
  - The funded percentage is projected to decline for the next 15 years before it begins to increase.
  - The funded percentage is projected to be below 40% for 6 years and below 50% for 26 years.
- If the City does not meet the Hiring Plan projections, and remains on the same hiring path (1-1-2018 Valuation Payroll inflated by the 2.75% payroll growth assumption) the projected results are as follows:
  - The funded percentage is projected to drop below 40% funded in 2026.
  - The funded percentage is projected to be below 40% for 38 years.
  - The funded percentage is projected to be below 30% for 22 years.
  - The funded percentage is projected to drop to a low of 25.85% in 2047 before it begins to increase to a 33% funded level in 2063.
- Takeaway: As we knew when HB 3158 was passed, HB 3158 created a path to solvency but the path is narrow with many risks and little room for error. Any early disruption in achieving the assumptions (both investment returns as well as hiring projections) could have a catastrophic impact on the funding of the plan.

DALLAS POLICE & FIRE PENSION SYSTEM

DISCUSSION SHEET

ITEM #2

Topic: **Public comment**

Discussion: This is an open forum for the public to provide input regarding DPFP to the Board and staff.

Sec. 3.01 (j-9) of Article 6243a-1 of Vernon's Revised Civil Statutes
Required Public Meeting – Thursday, September 13, 2018