

# **City of Philadelphia Municipal Retirement System**

**Actuarial Valuation Report  
as of July 1, 2018**

**Produced by Cheiron**

**April 2019**

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**LETTER OF TRANSMITTAL**

April 11, 2019

City of Philadelphia Municipal Retirement System  
Two Penn Center Plaza – 16<sup>th</sup> Floor  
Philadelphia, Pennsylvania 19102-1721

Dear Board Members:

At your request, we have performed the July 1, 2018 Actuarial Valuation of the City of Philadelphia Municipal Retirement System (the System).

In preparing our report, we relied on information (some oral and some written) supplied by the System's staff. This information includes, but is not limited to, plan provisions, employee data, and financial information. We performed an informal examination of the obvious characteristics of the data for reasonableness and consistency in accordance with Actuarial Standard of Practice No. 23. The results of this report are only applicable to the System's contribution for Fiscal Year Ending 2020. Future results may differ significantly from the current results presented in this report due to such factors as the following: plan experience differing from that anticipated by the assumptions; changes in assumptions; and changes in plan provisions or applicable law.

This report has been prepared in accordance with generally recognized and accepted actuarial principles and practices and our understanding of the Code of Professional Conduct and applicable Actuarial Standards of Practice set out by the Actuarial Standards Board as well as applicable laws and regulations. Furthermore, as credentialed actuaries we meet the Qualification Standards, as defined by the American Academy of Actuaries, to render the opinion contained in this report. This report does not address any contractual or legal issues. We are not attorneys, and our firm does not provide any legal services or advice.

This actuarial valuation report was prepared exclusively for the City of Philadelphia Municipal Retirement System for the purposes described herein and for the Plan auditor in completing an audit related to the matters herein. Other users of this report are not intended users as defined in the Actuarial Standards of Practice, and Cheiron assumes no duty or liability to such other users.

Finally, in preparation of this report, we have accepted the assumptions and methodologies as adopted by the Board of Pensions and Retirement for the City of Philadelphia Municipal Retirement System.

Sincerely,  
Cheiron

A handwritten signature in blue ink, appearing to read "K.A. Kent".

Kenneth A. Kent, FSA, FCA, MAAA, EA  
Principal Consulting Actuary

A handwritten signature in blue ink, appearing to read "Anu Patel".

Anu Patel, FSA, MAAA, EA  
Principal Consulting Actuary

**CITY OF PHILADELPHIA MUNICIPAL RETIREMENT SYSTEM  
JULY 1, 2018 ACTUARIAL VALUATION**

**SECTION I – BOARD SUMMARY**

The primary purpose of the actuarial valuation and this report is to disclose the following as of the valuation date:

- The financial condition of the City of Philadelphia Municipal Retirement System (the System),
- Past and expected future trends and risks to the Retirement System’s financial condition,
- The City’s Minimum Municipal Obligation (MMO) representing the required contribution in accordance with Act 205 of Pennsylvania Law for Fiscal Year End (FYE) 2020,
- The Revenue Recognition Policy (RRP) contribution amount requested by the City, and
- The Retirement Board’s Funding Policy recommended City contribution.

Cheiron has issued a separate report containing the information required by the Governmental Accounting Standards Board (GASB) and therefore that accounting information is not included in this valuation report.

In this Section, we present a summary of the principal valuation results. This includes the basis upon which the July 1, 2018 valuation was completed and an examination of the current financial condition of the System. In addition, we present a review of the key historical trends followed by the System’s projected financial outlook.

**CITY OF PHILADELPHIA MUNICIPAL RETIREMENT SYSTEM  
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**SECTION I – BOARD SUMMARY**

**A. Valuation Basis**

The June 30, 2018 valuation results are based on the same actuarial methods used in the June 30, 2017 valuation. The actuarial assumptions have been updated to reflect the new assumptions approved by the Retirement Board, as presented in the Experience Study Results for July 1, 2012 - June 30, 2017 in March 2018. The following outlines the basic assumption changes. For a detailed description of the methods and assumptions, refer to Appendix C of this report.

- **Interest Rate:** The interest rate was decreased from 7.65% to 7.60% as of July 1, 2018 as adopted by the Board in February 2018.
- **Mortality Rates:** Mortality base tables were updated to use the RP-2014 tables projected to 2021 using mortality improvement scale MP-2017 to reflect projected improvements in mortality over time until the next required experience analysis.
- **Salary Increase Rate:** There were increases in the Municipal salary assumptions by age.
- **Other Demographic Actuarial Assumptions:** Other demographic assumptions such as the retirement rates, termination rates, disability rates, service-connected disability rates, and marriage assumption for non-active members were updated to better reflect actual experience. A detailed list of these assumption changes is located in Appendix C of this report.

Council Bill No. 180557 and No. 180559 passed in June 2018, provide for two changes in Plan provisions for employees represented by Municipal groups:

- All Municipal members (except elected officials) hired or rehired on or after January 1, 2019 will participate in a Stacked Hybrid Plan – Plan 16. Benefits under Plan 16 are similar to Plan 87 except that the compensation used in determining the benefit is capped at \$65,000 (including DC 33 whose current pay cap is \$50,000).
- Current and new Municipal members will pay additional contributions that are tiered to increase based on the level of compensation effective January 1, 2019. New Municipal members will be covered by the Stacked Hybrid Plan such that tiered member contributions are only applied up to the \$65,000 compensation cap.

Council Bill No. 180557 passed in June 2018 reflects the final arbitrations for Police Officers and Firefighters and made the following changes to member contributions:

- Member contributions for current Police Officers and Firefighters in Plan 87 and Plan ‘10 were increased by 0.92% effective July 1, 2017, and an additional 0.92% effective July 1, 2018.
- For new Police Officers and Firefighters hired or rehired on or after July 1, 2017 member contributions rate is increased by 2.5% over the rate which would otherwise be in effect as of July 1, 2017.
- No changes in member contributions will be made for Police Officers and Firefighters in Plan 67.

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**SECTION I – BOARD SUMMARY**

There are three sources of anticipated additional revenue that will be received by the System:

- A portion of the sales tax revenue according to the State Legislation,
- Additional tiered member contributions based on salary level for current and future Municipal members, and
- Additional member contributions for current and future members in Plan 87 Police and Fire.

Typically, as additional contributions are received, the following years' MMOs are reduced as a function of the additional assets. However, the objective for these additional revenue sources is to dedicate them toward paying down the unfunded liability and not to reduce future City costs. This is referred to as the **Revenue Recognition Policy (RRP)** whereby the additional revenue coming into the System is tracked and accumulated in a notional account which is then deducted from the Actuarial Asset Value to determine the City's contribution. These amounts will be paid in addition to the Minimum Municipal Obligation (MMO).

At the same time, we calculate the MMO based on all assets including additional revenue sources for state reporting purposes under Act 205 and representation of the Actuarially Determined Contribution (ADC) under Governmental Accounting Standards.

This report was prepared using census data and financial information as of July 1, 2018 and does not reflect any subsequent changes in the membership or the assets.

Below we highlight significant results of this valuation:

- **Financial Performance:** The return on market value of assets at 9.01% for the year ending June 30, 2018, was higher than the expected 7.65% assumed return rate benchmarked. For funding purposes, the System applies an asset smoothing method to determine the Actuarial Value of Assets which phases in actuarial investment gains and losses over ten years. On an actuarial asset value basis the return as of June 30, 2018 was 5.11% resulting in an experience loss when compared to the 7.65% assumption.
  - The smoothing method also limits the actuarial asset method to not be greater than 120% nor less than 80% of the underlying market value of assets. The ratio of actuarial assets to market assets decreased from 104.8% in the prior year to 101.1% for the current year.
- **Pension Adjustment Fund (PAF):** As defined in the Philadelphia Code the PAF provides for additional benefits to current retirees through the use of excess earnings. Excess earnings are defined as returns in excess of the assumed return rate plus 1%. The asset return for the adjusted market value which is based on five-year smoothing of asset gains and losses was 6.47%. Because the return is below 8.65% (the assumed prior year rate of return of 7.65% plus 1.00%), there are no additional amounts transferred into the PAF as of June 30, 2018.

**CITY OF PHILADELPHIA MUNICIPAL RETIREMENT SYSTEM  
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- ***Unfunded Actuarial Liability (UAL):*** The UAL is the excess of the System’s actuarial liability (AL) over the actuarial value of assets (AVA). The UAL decreased from \$6.167 billion as of July 1, 2017 to **\$6.124 billion as of July 1, 2018** reflecting the effect of contributions toward paying down the unfunded offset by asset and liability losses from July 1, 2017 through June 30, 2018 as well as the changes in actuarial assumptions as of July 1, 2018.
  - The UAL decrease of \$43.5 million is comprised of liability losses of \$3.6 million from participants in transition from active to non-active status and mortality experience on retirees plus asset return losses of \$117.0 million. Assumption changes increasing the UAL by \$60.3 million from the experience study and the decrease in interest rate. These values are offset by contributions towards paying down the unfunded, differences in benefit accrual rates and interest on payment timing of \$224.5 million.
- ***Funding Ratio:*** This is the ratio of the System’s AVA to AL. The funding ratio increased from 45.3% as of July 1, 2017 to **46.8% as of July 1, 2018**, mainly due to underlying growth in assets and slower liability growth. While this ratio may appear to show slow progress in funding, the decrease in the assumed rate of return represents improvement of System’s risk profile increasing the likelihood of achieving this assumption in the future. The funding ratio on market assets to liability basis increased from 43.2% to 46.4%.
- ***Plan Changes:*** The change in plan provisions for Stacked Hybrid Plan for new hires and tier member contributions for Municipal members as well as increased member contributions for Firefighters impact future costs and do not have an impact on the AVA or AL as of July 1, 2018.
- ***Minimum Municipal Obligation (MMO):*** The MMO is the required minimum amount the City must contribute under Pennsylvania State Law. The MMO increased from \$668.3 million for FYE 2019 to **\$675.8 million for FYE 2020**.
- ***Revenue Recognition Policy (RRP):*** The contribution based on the RRP increased from \$680.8 million for FYE 2019 to **\$704.6 million for FYE 2020**. The balance of the notional account removed from the assets in calculating this contribution increased from \$30.0 million as of July 1, 2017 to \$63.1 million as of July 1, 2018.
- ***Contribution under the City’s Funding Policy:*** The beginning-of-year contribution under the City’s Funding Policy decreased from \$1,052.5 million for FYE 2019 based upon actual FYE 2018 payroll to an estimated **\$804.8 million for FYE 2020**.

Table I-1 summarizes the comparative UAL and fiscal year funding amounts discussed above.

**CITY OF PHILADELPHIA MUNICIPAL RETIREMENT SYSTEM  
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**SECTION I – BOARD SUMMARY**

<b>Table I-1 Key Results (\$ thousands)</b>			
<b>Valuation Date</b>	<b>7/1/2018</b>	<b>7/1/2017</b>	
Unfunded Actuarial Liability	\$ 6,123,546	\$ 6,167,057	
Funding Ratio	46.8%	45.3%	
	<b>Fiscal Year 2020</b>	<b>Fiscal Year 2019</b>	
Minimum Municipal Obligation	\$ 675,751	\$ 668,281	
Revenue Recognition Policy Contribution	\$ 704,589	\$ 680,808	
City's Funding Policy Contribution*	\$ 804,822	\$ 1,052,481	

\*The City's funding policy contribution for FYE 2019 was updated based upon the actual payroll of \$1,805.4 million (provided as pay rates in the data) as of July 1, 2018. In the July 1, 2017 actuarial valuation report, the estimated FYE 2019 payroll was \$1,802.3 million based on July 1, 2017 pay rates and increased with the payroll assumption.

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**SECTION I – BOARD SUMMARY**

**B. Current Financial Condition**

On the following pages, we summarize the key results of the July 1, 2018 valuation and how they compare to the results from the July 1, 2017 valuation.

**1. City Membership:**

As shown in Table I-2 below, total membership in the Retirement System increased by 0.4% from 2017 to 2018.

<b>Table I-2 Membership Total</b>				
	<b>July 1, 2018</b>	<b>July 1, 2017</b>	<b>% Change</b>	
Actives	28,845	28,615	0.8%	
Terminated Vesteds	1,074	1,157	-7.2%	
Disabled	3,890	3,942	-1.3%	
Retirees	22,275	22,288	-0.1%	
Beneficiaries	8,547	8,552	-0.1%	
DROP	1,944	1,767	10.0%	
Total City Members	66,575	66,321	0.4%	
Annual Salaries	\$ 1,805,400,096	\$ 1,744,728,288	3.5%	
Average Salary per Active Member	\$ 62,590	\$ 60,973	2.7%	
Annual Retirement Allowances	\$ 761,946,574	\$ 750,204,529	1.6%	
Average Retirement Allowance	\$ 21,951	\$ 21,569	1.8%	

The active participant population increased by 0.8% during the 2017-2018 plan year. Deferred Retirement Option Plan (DROP) participants increased 10.0% from 2017 to 2018 as more members enrolled in DROP than retired from DROP. The average salary per active member increased by 2.7% during the plan year. The result of increased active membership paired with the salary growth produced a total payroll growth of 3.5% versus the expected 3.3% payroll growth assumption.

Annual retirement allowances increased by 1.6% in aggregate with the average benefits increasing 1.8%. The total number of participants in pay status decreased 0.2% which is a reflection of the maturity of the System.

**CITY OF PHILADELPHIA MUNICIPAL RETIREMENT SYSTEM  
JULY 1, 2018 ACTUARIAL VALUATION**

**SECTION I – BOARD SUMMARY**

**2. City Assets and Liabilities:**

Table I-3 presents a comparison between the July 1, 2018 and July 1, 2017 system assets, liabilities, UAL, and funding ratios. The AVA Funding Ratio increased from 45.3% as of July 1, 2017 to **46.8%** as of July 1, 2018 despite the asset losses, liability losses, and changes in actuarial assumptions. Prior to the assumption changes the funded ratio would have been 47.1%.

<b>Table I-3 Assets and Liabilities (\$ thousands)</b>				
	<b>July 1, 2018</b>	<b>July 1, 2017</b>	<b>% Change</b>	
<b>Actuarial Liabilities by Membership:</b>				
Actives	\$ 3,924,324	\$ 3,900,095	0.6%	
Terminated Vesteds	104,765	111,367	-5.9%	
Disabled	782,082	758,314	3.1%	
Retirees	5,119,142	5,038,627	1.6%	
Beneficiaries	672,900	651,804	3.2%	
DROP	909,297	807,195	12.6%	
Non-Vested Refunds	8,470	8,274	2.4%	
Total Actuarial Liability (AL)	\$ 11,520,980	\$ 11,275,676	2.2%	
Market Value of Assets (MVA net of PAF)*	\$ 5,340,125	\$ 4,872,977	9.6%	
Actuarial Value of Assets (AVA net of PAF)*	\$ 5,397,434	\$ 5,108,619	5.7%	
Actuarial Assets minus Market Assets	\$ 57,309	\$ 235,642	-75.7%	
Unfunded Actuarial Liability	\$ 6,123,546	\$ 6,167,057	-0.7%	
Funding Ratio (AVA ÷ AL)	46.8%	45.3%	1.5%	
Funding Ratio (MVA ÷ AL)	46.4%	43.2%	3.2%	

\*The PAF is available for distribution under title §22-311 of the Philadelphia Code. In general, the PAF provides for enhanced benefit distribution to retirees and beneficiaries through the use of excess earnings. For more details on the PAF, see Section II – E

The market asset value average return is 9.01% compared to the 7.65% assumption for the previous year. For the actuarial value of assets, the investment gains and losses are smoothed over future years, which yielded a rate of return of 5.11%.

**CITY OF PHILADELPHIA MUNICIPAL RETIREMENT SYSTEM  
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**SECTION I – BOARD SUMMARY**

**3. Components of UAL Change between July 1, 2017 and July 1, 2018:**

The Retirement System’s unfunded actuarial liability decreased by \$43.5 million, from \$6,167.1 million as of July 1, 2017 to \$6,123.6 million as of July 1, 2018. Table I-4 presents the specific components of this change in the UAL.

The System experienced a \$117.0 million asset loss based upon the actuarial value of assets and a \$3.6 million liability loss which is attributable to demographic experience. There was also an additional liability of \$60.3 million due to the changes in assumptions (changes from the experience study and the decrease in interest rate). Actual FYE 2018 contributions when compared to the expected MMO created a net gain of \$51.4 million due to higher than expected contributions and timing of contributions. **The higher contributions under RRP in comparison to MMO resulted in a gain of \$25.1 million.** There was a \$6.7 million loss due to the one year deferral of gains and losses under the MMO funding requirements. When these changes are compared to the expected pay down of the UAL as part of the MMO there is a net decrease in the UAL of \$43.5 million over what is expected as of July 1, 2018.

<b>Table I-4</b>	
<b>Change in Unfunded Actuarial Liability (UAL)</b>	
<b>(\$ thousands)</b>	
<b>Experience</b>	
1. UAL change due to asset (gain)/loss*	\$ 117,047.4
2. UAL change due to overall liability (gain)/loss	\$ 3,639.7
<b>Contributions</b>	
3. UAL change due to difference in benefit accruals, actual contributions and timing	\$ (51,449.8)
4. UAL change due to one-year delay in MMO contributions	\$ 6,742.3
5. UAL change due to RRP contributions in excess of the MMO contributions	\$ (25,084.1)
<b>Total (Gain)/Loss Amortization Base</b>	
6. Total UAL change due to gains and losses: sum 1 through 5	\$ 50,895.5
<b>Plan Changes</b>	
7. UAL change due to plan changes	\$ 0
<b>Assumption Changes</b>	
8. UAL change due to assumption changes	\$ 60,314.0
<b>Total</b>	
9. Total net overall change: 6 + 7 + 8	\$ 111,209.5
10. UAL change due to benefit accruals and payments, contributions, and interest	<u>(154,718.9)</u>
11. Net increase/(decrease) in UAL: 9 + 10	\$ (43,509.4)

\* Includes loss due to PAF transfer, if applicable

**CITY OF PHILADELPHIA MUNICIPAL RETIREMENT SYSTEM  
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**SECTION I – BOARD SUMMARY**

**4. Contributions:**

Table I-5 below summarizes the City contribution amounts. The **Minimum Municipal Obligation** for FYE 2020 measured as of the beginning of the year decreased by 0.85% of payroll, from 37.08% to 36.23%. In dollar terms, the required beginning of year contribution increased from \$668.3 million to \$675.8 million, a \$7.5 million increase. Though the MMO increased in dollar amounts, it decreased as a percent of pay because total payroll increased more than the increase in MMO over the last year. This is because the amortization of experience losses and assumption changes had less of a relative impact than the increase in active members and salary increases coupled with an increase in employee contribution rates. So while growth in active membership will result in the dollar normal cost increasing, the new employee contribution rates and higher payroll over which the unfunded liability is paid down as a level payment amount will result in lower costs as a percent of pay.

The contribution under the **Revenue Recognition Policy** increased by 0.01% as a percent of payroll, from 37.77% to 37.78% for FYE 2020. The contribution in dollar amount increased from \$680.8 million in the prior year to \$704.6 million for FYE 2020. The RRP contribution is higher than the MMO due to excluding accumulated sales tax revenue and additional member contributions received, from the assets when determining the RRP contributions.

For Fiscal Year 2020, the **City Funding Policy** contributions decreased by 15.15% of payroll, from 58.30% to 43.15%. In dollar terms, the contributions under the City's Funding Policy decreased from \$1,052.5 million to \$804.8 million, a \$247.7 million decrease. The decrease in the funding policy is attributable to the expected payment in full of the initial July 1, 1984 unfunded liability base which was amortized over 34 years ending FYE 2019. All contributions for the City's Funding Policy are provided as of the beginning of the year.

In Section IV of this report, we provide more detail on the development of these contributions.

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**SECTION I – BOARD SUMMARY**

**Table I-5  
Contributions  
(\$ thousands)**

<b>Fiscal Year Ending in Year:</b>	<b>2020</b>	<b>% of Pay</b>	<b>2019</b>	<b>% of Pay</b>
<b>Minimum Municipal Obligation <sup>1</sup></b>				
Estimated FY Payroll	\$ 1,864,978		\$ 1,802,304	
Normal Cost (with Expenses)	\$ 188,203	10.09%	\$ 170,096	9.44%
Regular Employee Contributions	(80,734)	4.33%	(74,053)	4.11%
Extra Employee Contributions for Funding <sup>3</sup>	<u>(22,956)</u>	1.23%	<u>(9,740)</u>	0.54%
City Normal Cost	\$ 84,513	4.53%	\$ 86,303	4.79%
Amortization Payment	<u>591,238</u>	31.70%	<u>581,978</u>	32.29%
Minimum Municipal Obligation	\$ 675,751	36.23%	\$ 668,281	37.08%
<b>Revenue Recognition Policy <sup>2</sup></b>				
Estimated FY Payroll	\$ 1,864,978		\$ 1,802,304	
Normal Cost (with Expenses)	\$ 188,203	10.09%	\$ 170,096	9.44%
Regular Employee Contributions	(80,734)	4.33%	(74,053)	4.11%
Extra Employee Contributions for Funding <sup>3</sup>	<u>(0)</u>	0.00%	<u>(0)</u>	0.00%
City Normal Cost	\$ 107,469	5.76%	\$ 96,043	5.33%
Amortization Payment	<u>597,120</u>	32.02%	<u>584,765</u>	32.45%
Revenue Recognition Policy	\$ 704,589	37.78%	\$ 680,808	37.77%
<b>City's Funding Policy <sup>4</sup></b>				
Estimated FY Payroll	\$ 1,864,978		\$ 1,805,400 <sup>5</sup>	
Normal Cost (with Expenses)	\$ 188,203	10.09%	\$ 169,190	9.37%
Regular Employee Contributions	(80,734)	4.33%	(72,450)	4.01%
Extra Employee Contributions for Funding <sup>3</sup>	<u>(22,956)</u>	1.23%	<u>(9,740)</u>	0.54%
City Normal Cost	\$ 84,513	4.53%	\$ 87,001	4.82%
Amortization Payment	<u>720,309</u>	38.62%	<u>965,480</u>	53.48%
City's Funding Policy	\$ 804,822	43.15%	\$ 1,052,481	58.30%

<sup>1</sup> The MMO does not include Quasi-Agency contributions.

<sup>2</sup> Revenue Recognition Policy (RRP) is based on the calculation of MMO without including accumulated sales tax revenue and additional member contribution amounts received.

<sup>3</sup> Additional tier member contributions under Municipal Plans 67, 87, and 16 and the 2017 Police and Fire Arbitration for Plan 87 are specifically dedicated to paying down the unfunded liability and are recognized as employee contributions under MMO and Funding Policy but not under the RRP contribution.

<sup>4</sup> Assuming beginning-of-year payment.

<sup>5</sup> FY 2019 Payroll for the City's Funding Policy is based upon the 7/1/2018 pay rates and will be finalized when the FYE 2019 payroll is available. All other payroll is estimated based upon the prior year's data used for the actuarial valuation.

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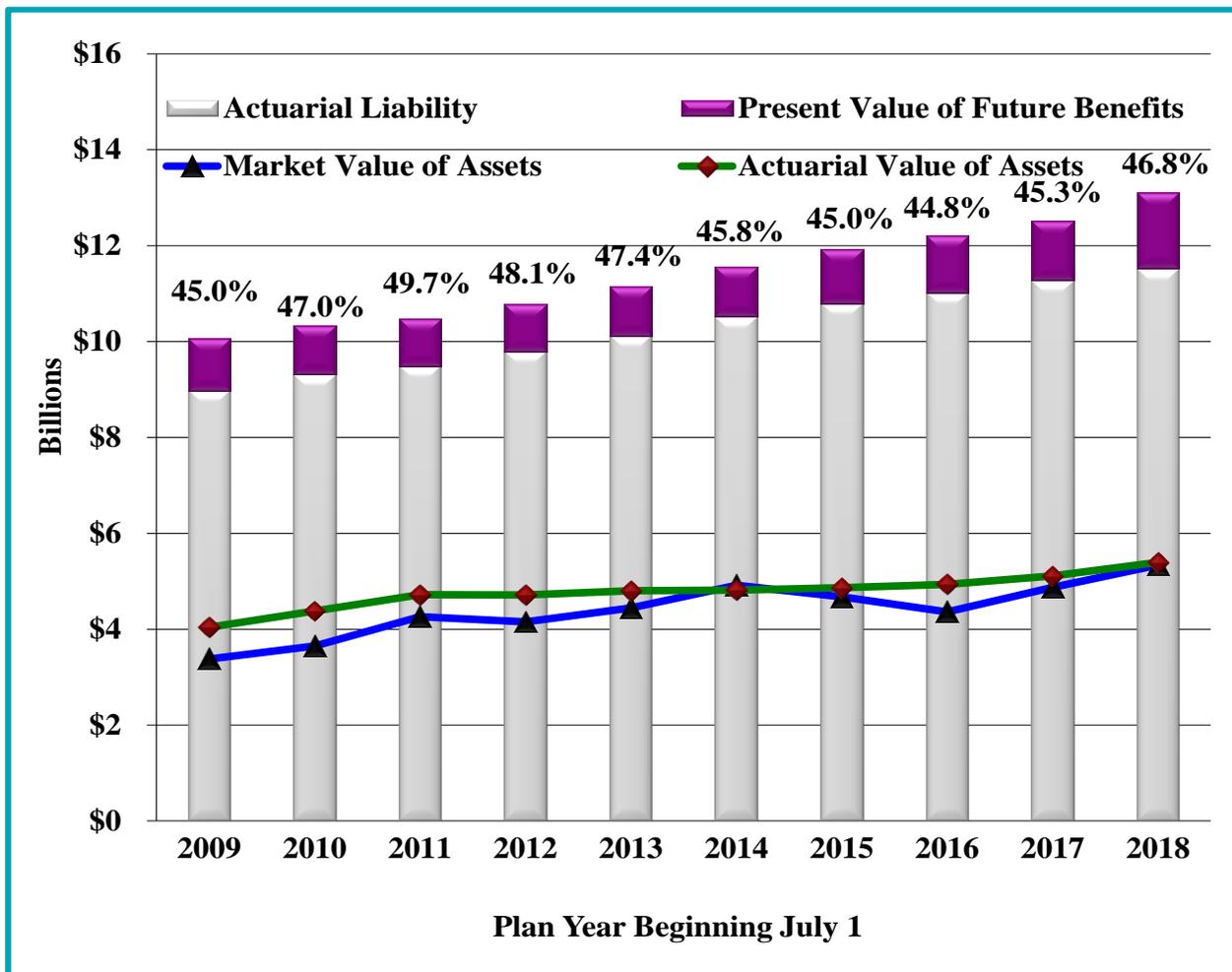
**SECTION I – BOARD SUMMARY**

**C. Historical Trends**

Although most of the attention given to the valuation reflects the most recently computed unfunded actuarial liability, funding ratio, and contribution amounts, it is important to remember that each valuation is merely a snapshot of the long-term progress of a pension fund. It is equally important to judge a current year’s valuation result relative to historical trends, as well as trends expected into the future.

In the chart below, we present the historical trends for the market and actuarial value of assets compared to the actuarial liabilities and present value of future benefits; we also show the progress of the Retirement System’s funding ratios on an actuarial value of asset basis (provided above each bar) since 2009.

**City of Philadelphia Assets\* and Liabilities – 2009 to 2018**



\* Market value of assets includes the PAF, which is not available for funding purposes.

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The System’s funding ratio has remained relatively stable since 2009. It is important to note that the assumed interest rate assumption has been decreased during this period from 8.25% to 7.60% which has lowered the funding ratio but has improved the System’s risk profile. Besides the regular reductions of the interest rate assumption during this period the changes in the ratio are also due to the volatility of the markets. In 2018, the funding ratio increased by 1.5%.

This historic trend emphasizing the relatively low funding status highlights the potential risk of running out of assets to pay benefits. However, as long as the City adheres to the continued policy of contributing at least the Minimum Municipal Obligation this risk will be avoided.

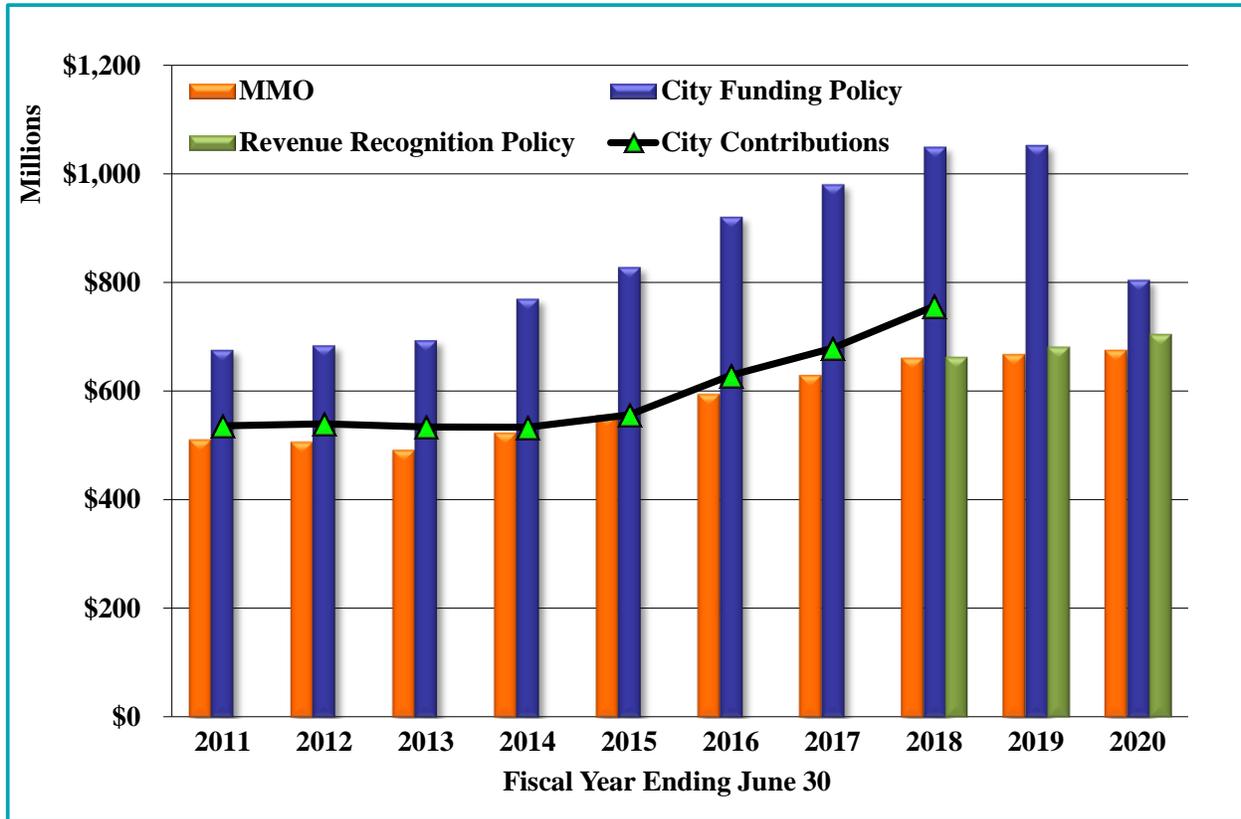
Another observation is that assets have remained relatively flat over the projection period. This is a function of the negative cash flow as contributions and investment income have to keep pace with benefit payouts and expenses before the absolute value of assets can grow. However, the steps taken by the City and participants in providing additional contributions to the System has reduced this cash flow risk significantly. This is demonstrated later in the summary section.

In the chart on the next page, we present historical trends for the Minimum Municipal Obligation (MMO), the contributions under the City’s Funding Policy, the Revenue Recognition Policy (RRP) beginning in 2018, and the actual City contributions made for fiscal years since 2011. Because there is a two-year lag in the determination of the City Funding Policy, RRP and MMO requirements, we show the contributions to date and the estimated amounts for fiscal years 2019 and 2020. The FYE 2011 City contributions include the \$80 million deferred contributions which have been fully paid during FYE 2013. The deferred contributions are subsequently included in the asset value as if they were made when due in accordance with special funding provisions under Act 205, and treated as if they are short-term investments and therefore not reflected in the actual City contributions received during FYE 2013. The City contributions include sales tax revenue amounts contributed to the System by the City. FYE 2018 was the third year sales tax revenue was received in the amount of \$24.2 million.

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**City of Philadelphia Contributions for Fiscal Years 2011-2020**



The key trend illustrated in this chart is the continuous growth in all measures since FYE 2011 due in part to ten-year smoothing of historical investment losses, assumption changes and the City’s decision to fund based on the MMO instead of the funding policy. This has slowed the funding progress in maintaining the funding policy and has resulted in losses under the funding policy due to contribution amounts being lower than what the policy calls for. These losses result in the increasing gap between the funding policy amount and the MMO. However, with the full payment of the initial funding policy base in FYE 2019, the funding policy has decreased significantly and is closer to the MMO in FYE 2020.

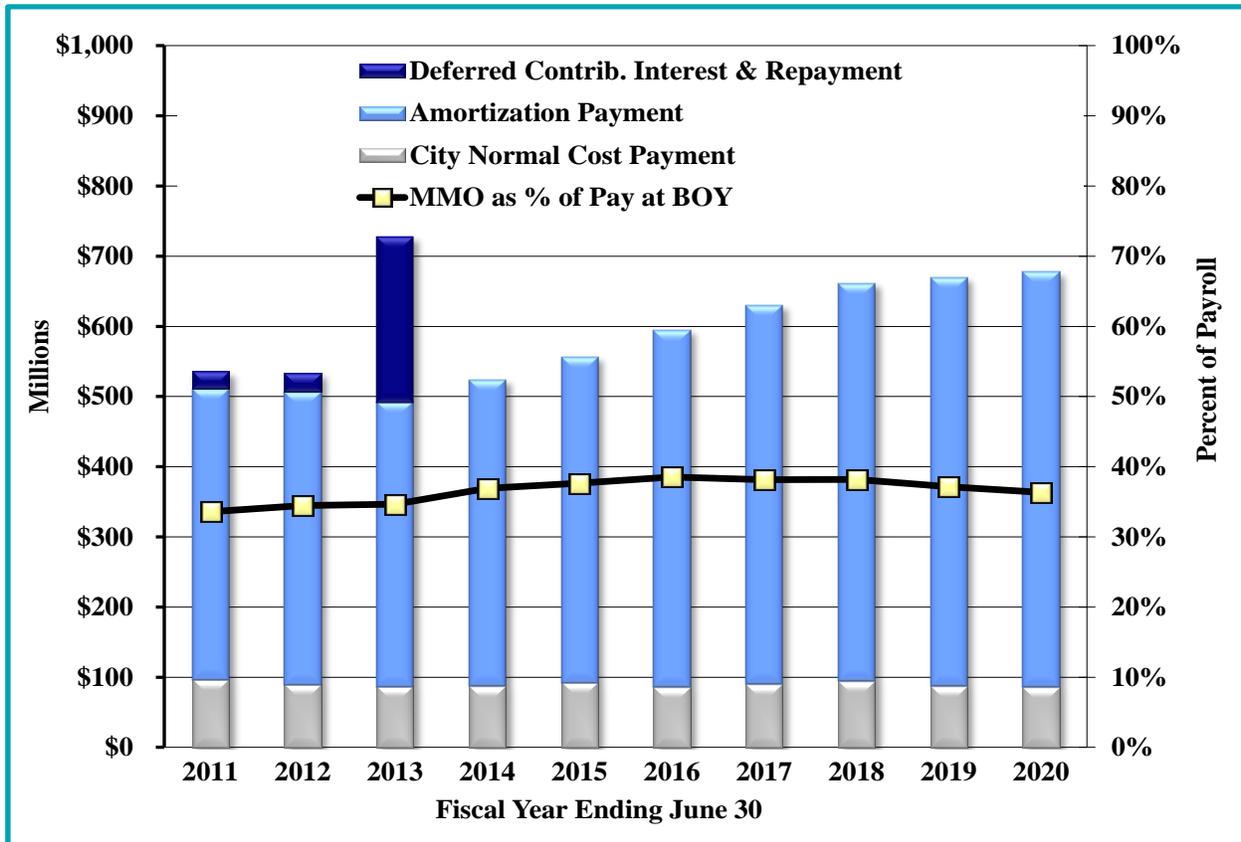
The RRP is shown in the green bars starting FYE 2018. In FYE 2020, the RRP is approximately \$28.8 million higher than the MMO. In future years, as the tax revenue and tiered and additional member contributions paid in excess of the MMO accumulate, the gap between the MMO and the RRP will continue to grow.

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The chart below shows the historical amortization payments, City normal cost payments, and the deferred contribution interest and principal repayment. The City normal cost payments include an explicit administrative expense assumption. The black line which goes with the axis on the right shows the beginning-of-year MMO (normal cost plus amortization payments only, not including the deferred contributions) as a percentage of payroll.

**MMO Contributions by Source for Fiscal Years 2011-2020**



The chart illustrates that the City normal cost payment increased gradually through FYE 2018 and decreased slightly in FYE 2019 and 2020 due to increased member contributions. The amortization payment to pay off the unfunded actuarial liability has increased from \$414 million for FYE 2011 to \$591 million for FYE 2020. Since FYE 2013, the amortization amounts have increased steadily due to the changes in assumptions that have had a net result of increasing liabilities and continued recognition of the 2008 investment losses.

The total City cost (normal cost plus amortization payments) as a percentage of payroll (as shown by the line and on the right hand axis) was about 34% in FYE 2011, then increased gradually as the investment losses of FYE 2008 and 2009 get recognized over time, and decreased slightly to the current level of approximately 36% in FYE 2020.

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**D. Projected Financial Trends**

Our analysis of the City of Philadelphia Municipal Retirement System’s projected financial trends is an important part of this valuation. In this section, we present our assessment of the implications of the July 1, 2018 valuation results on the future outlook in terms of benefit security (assets over liabilities) and the City’s expected cost progression.

In the charts that follow, we project the Retirement System’s assets and liabilities, and the City’s contributions. Our illustrations assume the provisions of Act 205 as amended by Act 44 remain in force during the projection period. The projections are based on the assumptions of the July 1, 2018 valuation and additionally reflect the decrease in interest rate assumption from 7.60% to 7.55% as of July 1, 2019 as adopted by the Board.

These projections assume that new Police and Fire employees who have the option to elect out of Plan 10 and into Plan 87 will choose to participate in Plan 87 and pay higher member contributions. All projections also reflect future new hires in all Municipal groups who will participate in the Stacked Hybrid Plan - Plan 16. Stacked plan benefits and contributions are based on pay up to a cap of \$65,000 resulting in lower future costs for this group.

All projections include expected additional funds from sales tax revenue and additional member contributions for current and future Municipal members and members of 1987 Plans Police and Fire. The amounts of expected sales tax provided to us by the City (as shown in the table below).

The treatment of the sales tax and tiered and additional member contributions varies based on whether or not these amounts are used to reduce future City costs. Typically, as additional contributions are received, the following years MMOs are reduced as a function of the additional assets. However, under the RRP the benefit from the sales tax revenue and additional member contributions are dedicated to fund the unfunded liability over reducing the City’s contribution obligation such that this revenue is in addition to what the MMO would be without these additional assets. Charts shown based on the RRP funding methodology set these assets aside in a notional account which is deducted from actuarial asset value in determining the contributions under the RRP. We show three sets of projections for contributions based on MMO calculated in accordance with Act 205 compared to RRP and finally the Funding Policy.

The following chart reflects the expected projected sales tax revenue provided to us by the City for our analysis.

Fiscal Year Ending	<b>2019</b>	<b>2020</b>	<b>2021</b>	<b>2022</b>	<b>2023</b>
Expected Sales Tax	\$ 45,202,397	\$ 51,462,969	\$ 56,829,345	\$ 62,151,195	\$ 67,560,424
Fiscal Year Ending	<b>2024</b>	<b>2025</b>	<b>2026</b>	<b>2027</b>	<b>2028</b>
Expected Sales Tax	\$ 72,203,932	\$ 77,009,031	\$ 81,934,256	\$ 86,982,613	\$ 92,157,178
Fiscal Year Ending	<b>2029</b>	<b>2030</b>	<b>2031</b>	<b>2032</b>	<b>2033</b>
Expected Sales Tax	\$ 97,461,108	\$ 102,897,635	\$ 108,470,076	\$ 114,181,828	\$ 120,036,374
Fiscal Year Ending	<b>2034</b>	<b>2035</b>	<b>2036</b>	<b>2037</b>	<b>2038</b>
Expected Sales Tax	\$ 126,037,283	\$ 132,188,215	\$ 138,492,921	\$ 144,955,244	\$ 151,579,125

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The following projections reflect the change in discount rate assumption from 7.60% to 7.55% as of July 1, 2019 as adopted by the Board and are baseline projections assuming all actuarial assumptions are met. We show three sets of projections for each of the three funding policies. For each set of projections, we show two graphs covering the historical period from 2008 to 2018 and the projected period from 2019 to 2038 assuming all assumptions are met.

The top graph shows asset measures (green and blue lines) compared to liabilities (grey bars). At the top of the graph is the progression of the System’s funding ratio which compares the actuarial value of assets (blue lines) to the actuarial liability (grey bars). The bars for the historical period are lighter shaded.

The bottom graph shows the MMO (red bars) including the impact on MMO reductions as a function of expected sales tax revenue (blue bars) and expected tiered and member contributions (black bars). The blue line shows the Funding Policy and the green line shows the expected City contributions under the RRP which includes the sales tax revenue and additional member contributions that are expected to be contributed on top of the MMO.

We show stress testing to illustrate the impact of varying returns on the System in Section II – Assessment and Disclosure of Risk of this report. We do this because the System’s asset return will never be level from year to year and the System must anticipate the implications of asset return volatility to the funded status and contribution requirements.

In reviewing each of these projections, it is the future trends, not necessarily the actual values that are important to observe in consideration of the risks of the System and the potential volatility of future funding ratios and City contribution levels.

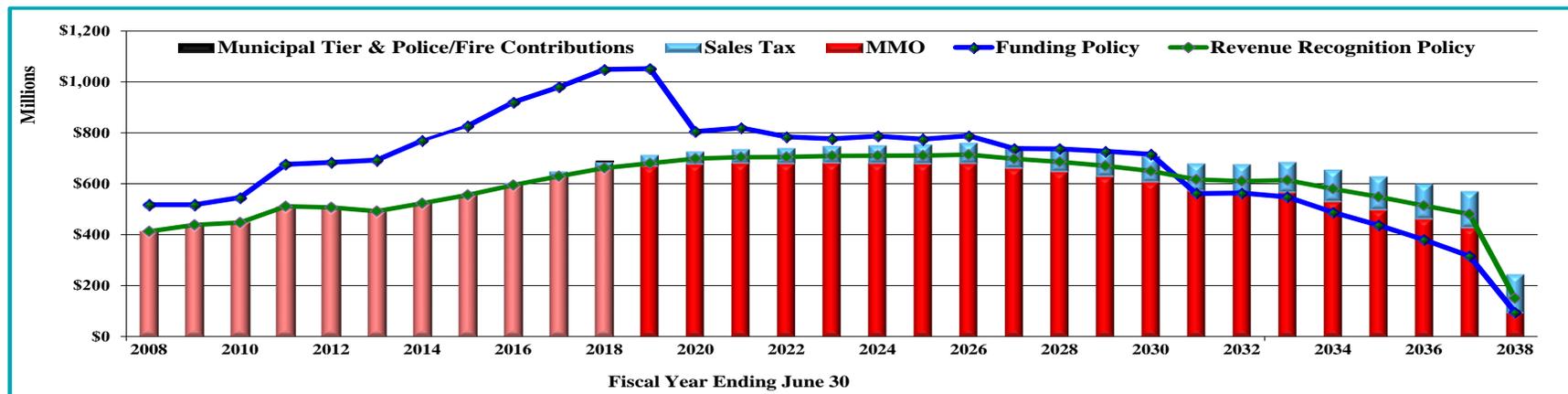
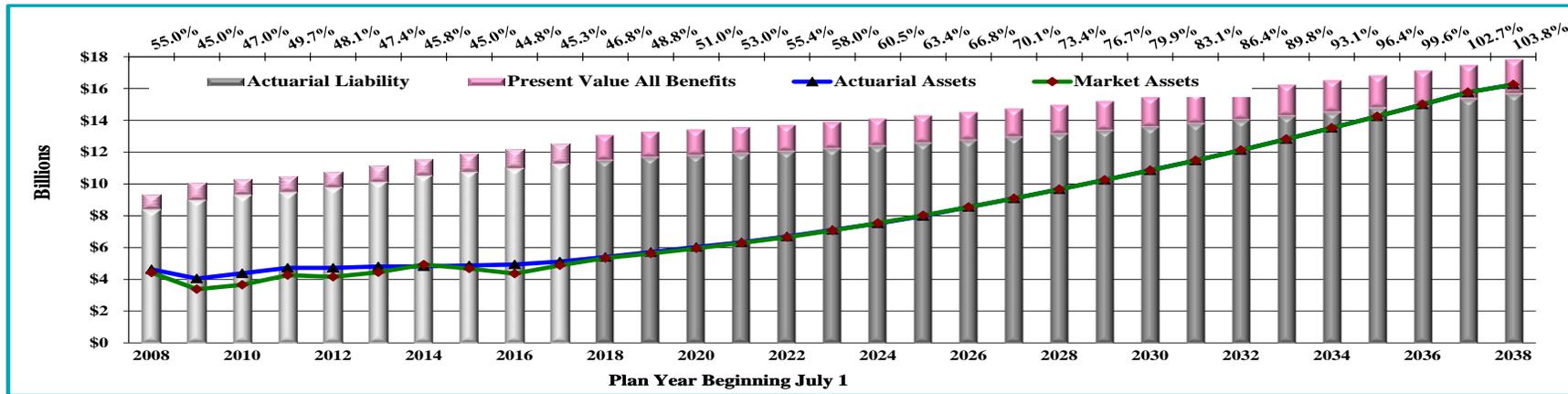
We note that when the System becomes 70% funded or greater, the unfunded liability may be amortized on a rolling 10-year basis. We have not shown the implications of this alternative funding method provided for in Act 205.

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**Baseline Projection Set 1: City Makes Contributions based on MMO**

If the City was to contribute based on the MMO the System is expected to reach 80% in 2031 and 100% funded by 2037. The projections demonstrate a number of issues. Funding at the MMO level with the current ten-year asset smoothing method and the 2009, 30-year fresh start amortization method on a level-dollar basis, would result in a relatively slow improvement of funding.



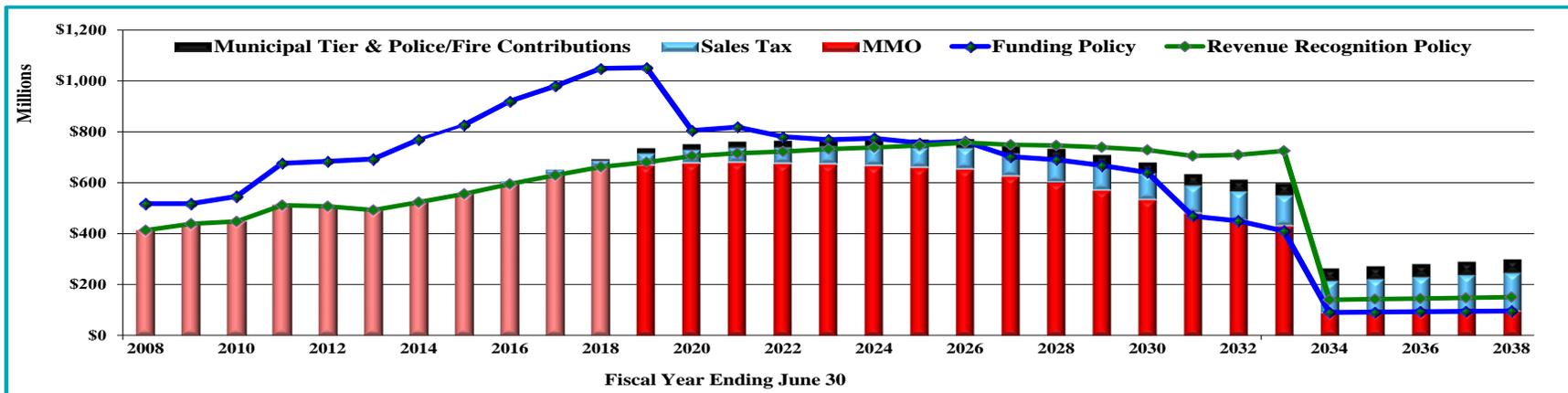
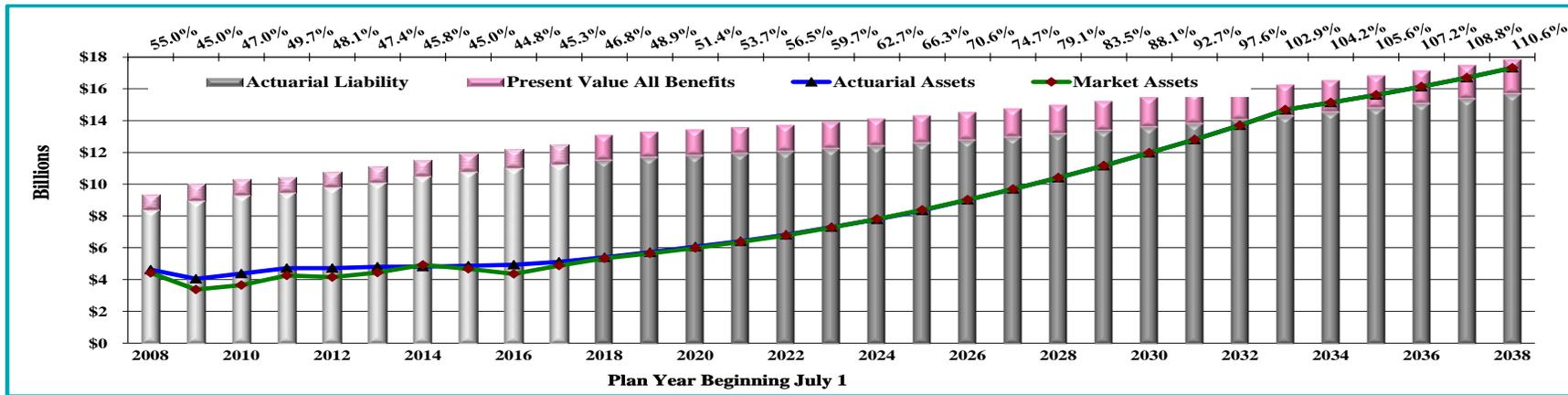
The decrease in FYE 2020 for the City’s Funding Policy (blue line) is due to the expected payment in full of the initial unfunded liability.

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**Baseline Projection Set 2: City Makes Contributions based on RRP**

This chart illustrates the impact on the funded status when the additional revenue from sales tax and additional member contributions is specifically used to pay down the unfunded liability under the Revenue Recognition Policy as opposed to reducing future costs. The System is projected to be 80% funded by 2029 and 100% funded by 2033, four years earlier than under the MMO projections. By the end of the projection period, the System is expected to be funded at 110.6% compared to 103.8% when MMO contributions are made.



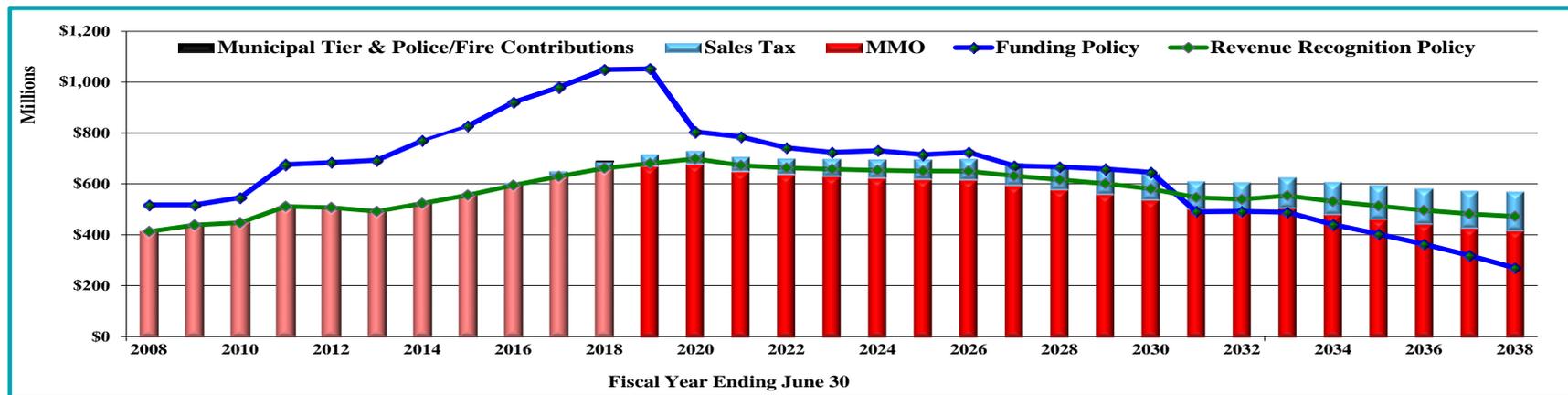
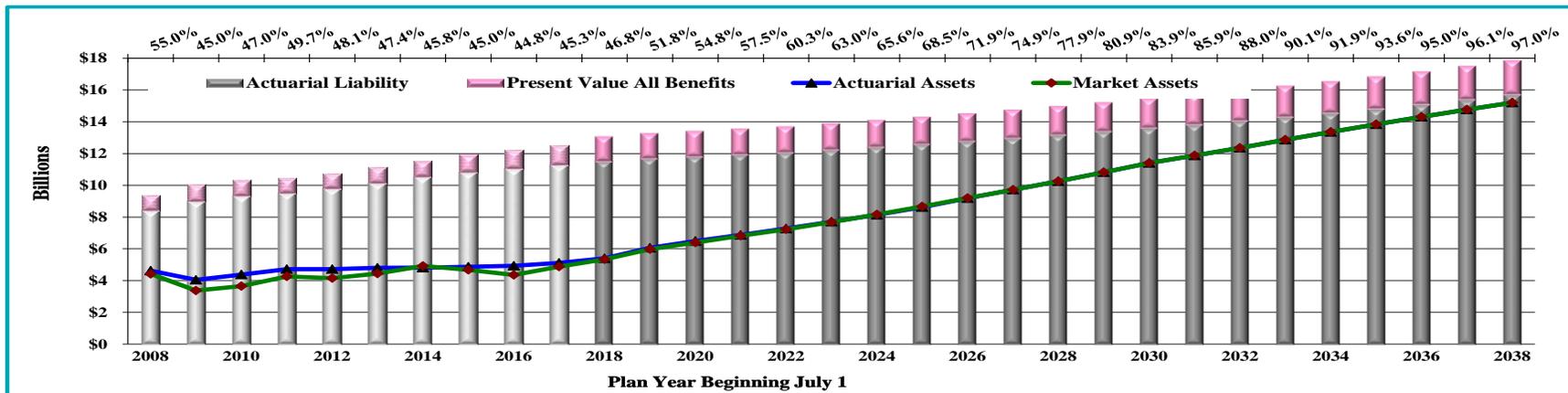
Sales tax revenue and additional member contributions are included in the green line which shows the RRP contributions. The RRP contribution is higher than the MMO until the System reaches 100% funded in FYE 2034 at which time it drops to the normal cost rate.

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**Baseline Projection Set 3: City Makes Contributions based on the Funding Policy**

If the City’s Funding Policy is contributed every year going forward, the System reaches a funded ratio of 97.0% by 2038. In this projection, we have assumed that the City may use sales tax revenue and additional member contributions to meet the requirements of the Funding Policy. Over time the contributions under the Funding Policy are lower than the RRP, therefore, resulting in a lower funded ratio by the end of the projection period.



Significantly larger contributions are assumed through FYE 2020 when projected contributions decline more rapidly after the initial funded base is expected to be paid off in FYE 2020.

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**SECTION II – ASSESSMENT AND DISCLOSURE OF RISK**

Actuarial valuations are based on a set of assumptions about future economic and demographic experience. These assumptions represent a reasonable estimate of future experience, but actual future experience will undoubtedly be different and may be significantly different. This section of the report is intended to identify the primary risks to the plan, provide some background information about those risks, and provide an assessment of those risks.

**Identification of Risks**

The fundamental risk to the System is that the contributions needed to pay the benefits become unaffordable. While there are a number of factors that could lead to contribution amounts becoming unaffordable, we believe the primary risks are:

- Investment risk,
- Longevity and other demographic risks, and
- Assumption change risk.

*Investment Risk* is the potential for investment returns to be different than expected. Lower investment returns than anticipated will increase the unfunded actuarial liability necessitating higher contributions in the future unless there are other gains that offset these investment losses. The potential volatility of future investment returns is determined by the System’s asset allocation and the affordability of the investment risk is determined by the amount of assets invested relative to the size of the plan sponsor or other contribution base.

*Longevity and other demographic risks* are the potential for mortality or other demographic experience to be different than expected. Our mortality assumption has consistently used a mortality improvement scale to project rates past the valuation date to reflect projected improvements in mortality over time. In addition, there is the requirement to measure actual experience against the assumptions every four years. Currently, the System pays out over \$800 million in benefit payments each year which is a cash flow risk as members continue to live longer. Generally, longevity and other demographic risks emerge slowly over time.

*Assumption change risk* is the potential for the environment to change such that future valuation assumptions are different than the current assumptions. For example, declines in interest rates over the last three decades resulted in higher investment returns for fixed income investments, but lower expected future returns necessitating either a change in investment policy, a reduction in discount rate, or some combination of the two. Assumption change risk is an extension of the other risks identified, but rather than capturing the risk as it is experienced, it captures the cost of recognizing a change in environment when the current assumption is no longer reasonable.

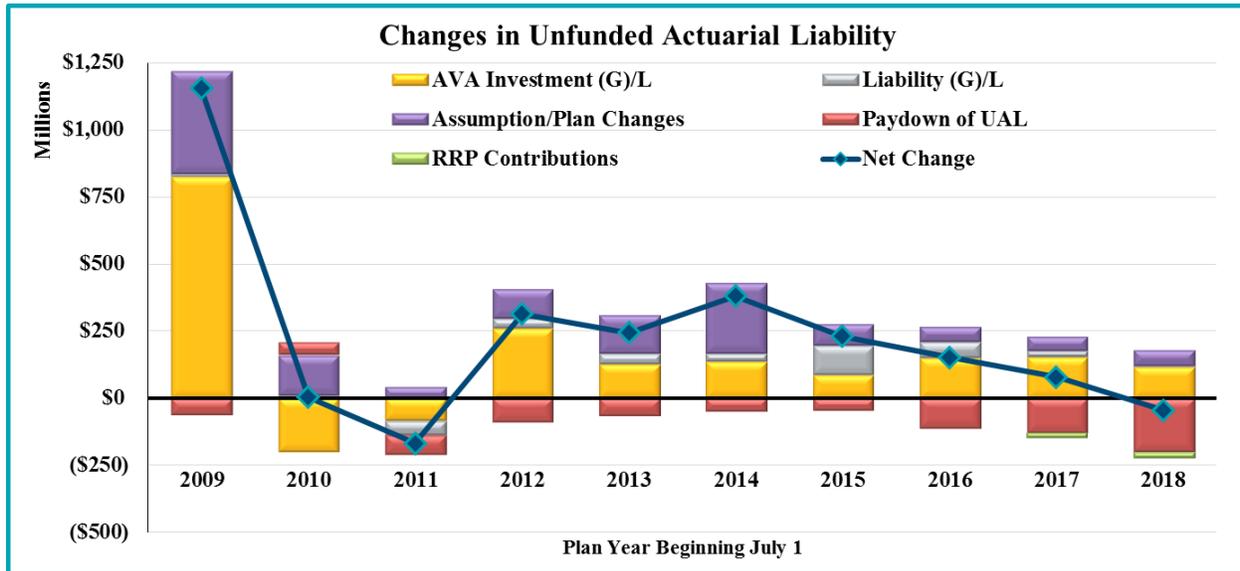
The chart below shows the components of changes in the Unfunded Actuarial Liability (UAL) for the System over the last 10 years, including investment gains and losses on the Actuarial Value of Assets, liability gains and losses, assumption and benefit changes, paying down of the UAL, and RRP contributions in excess of the MMO. The net UAL change is shown by the dark blue line. Table II-1 below the chart summarizes the changes in the UAL over the last 10 years.

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These totals support our identification of investment returns, longevity, and assumption changes as the primary risks to the System.

**Historical Changes in UAL 2009-2018**



	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	Total
<b>Discount Rate</b>	8.25%	8.15%	8.10%	7.95%	7.85%	7.80%	7.75%	7.70%	7.65%	7.60%	
<b>Source</b>											
AVA Investment (G)/L	\$ 822.4	\$ (201.9)	\$ (84.4)	\$ 260.7	\$ 127.7	\$ 136.5	\$ 87.0	\$ 148.8	\$ 152.0	\$ 117.0	<b>\$1,565.8</b>
Liability (G)/L	10.2	8.6	(54.3)	35.9	39.3	31.0	107.9	62.1	23.9	3.6	<b>268.2</b>
Assumptions/Plan Changes <sup>1</sup>	384.4	151.2	42.3	108.5	143.1	262.2	81.0	54.7	52.4	60.3	<b>1,340.1</b>
Paydown of UAL <sup>2</sup>	(62.8)	45.4	(71.4)	(90.4)	(66.3)	(49.5)	(45.8)	(113.8)	(130.9)	(199.4)	<b>(784.9)</b>
RRP Contributions <sup>3</sup>	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	(19.2)	(25.1)	<b>(44.3)</b>
<b>Total UAL Change</b>	<b>\$1,154.2</b>	<b>\$ 3.3</b>	<b>\$ (167.8)</b>	<b>\$ 314.7</b>	<b>\$ 243.8</b>	<b>\$ 380.2</b>	<b>\$ 230.1</b>	<b>\$ 151.8</b>	<b>\$ 78.2</b>	<b>\$ (43.6)</b>	<b>\$2,344.9</b>

<sup>1</sup> Plan changes include \$3.5 million increase in 2016.

<sup>2</sup> UAL change due to benefit accruals and payments, contributions, timing, and interest.

<sup>3</sup> UAL change due to RRP contributions in excess of the MMO contributions.

On a smoothed asset basis, the investment gains and losses (gold bars) from 2009 to 2018 reflect material investment losses driven by the market decline of 2008 and 2009, which was spread over the ten successive years. Over the 10-year period, investment losses have added approximately \$1.57 billion to the UAL.

On the liability side (gray bars), the System has experienced mostly losses, however much smaller in magnitude compared to the assets, increasing the UAL by approximately \$0.27 billion over the 10-year period.

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Assumption and plan changes (purple bars) over the last 10 years have increased the UAL by about \$1.34 billion. As a note, the only plan change during the period occurred in 2016 which increased the UAL by about \$3 million. The significant assumption changes have included reductions in the discount rate from 8.25% to 7.60% as well as experience studies in 2010, 2014, and 2018. It is important to note that investment return changes simply reflect a downward revision to the estimate of future investment earnings and ultimately costs will be determined by actual investment earnings. With the continued low-interest rate environment, we are continuing to see investment consultants reduce their capital market assumptions. As a result, future expectations of investment returns may continue to decline necessitating further reductions in the discount rate.

In addition, increases in UAL due to the experience studies have been primarily driven by decreasing mortality rates and projecting mortality improvement. This accounts for members living longer and the longevity risk for the System.

Each year, the UAL is expected to decrease due to paying down of the UAL from the contributions coming into the System. Changes due to paying down the UAL (red bars), related to benefit accruals and payments, contributions, and timing, have decreased the UAL by about \$0.78 billion over the last 10 years.

Finally, starting in 2016, the City has started contributing at higher amounts under the RRP in comparison to MMO. In the last two years, RRP contributions (green bars) in excess of the MMO contributions have decreased the UAL by about \$44 million. In future years, as the tax revenue and tiered and additional member contributions paid in excess of the MMO accumulate, this amount will continue to increase.

### **Plan Maturity Measures**

The future financial condition of a mature pension plan is more sensitive to each of the risks identified above than a less mature plan. Before assessing each of these risks, it is important to understand the maturity of the plan compared to other plans and how the maturity has changed over time.

Plan maturity can be measured in a variety of ways, but they all get at one basic dynamic - the larger the plan is compared to the contribution or revenue base that supports it; the more sensitive the plan will be to risk. The measures below have been selected as the most important in understanding the primary risks identified for the System.

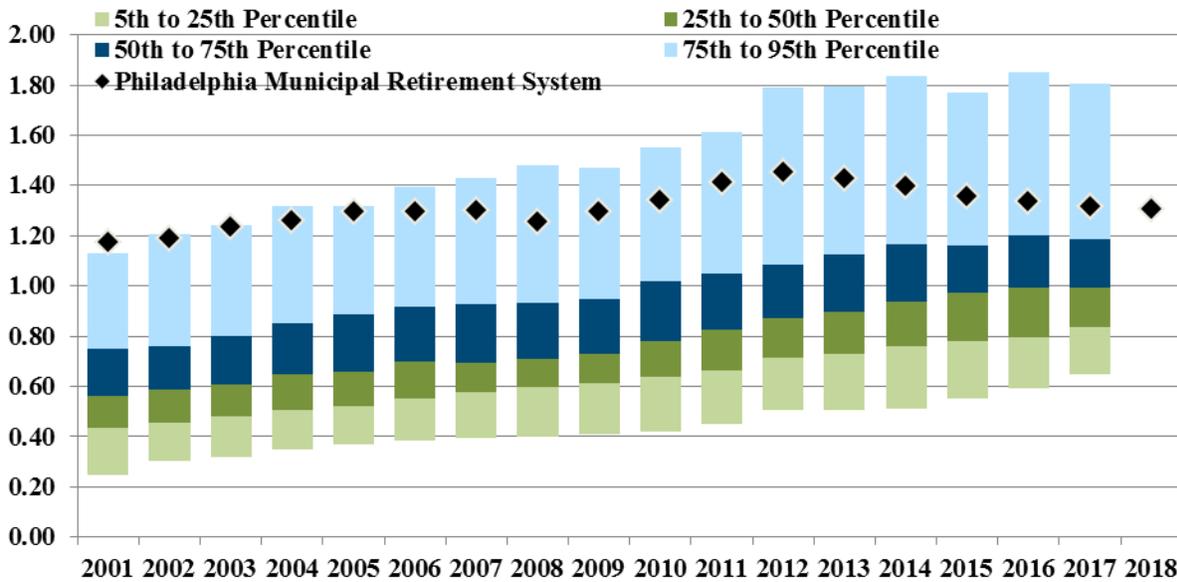
#### **Inactives per Active (Support Ratio)**

One simple measure of plan maturity is the ratio of the number of inactive members (those receiving benefits or entitled to a deferred benefit) to the number of active members. We refer to this ratio as the *support ratio*. The revenue base supporting the plan is usually proportional to the number of active members, so a relatively high number of inactives compared to actives indicate a larger plan relative to its revenue base as well.

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**Support Ratio - Inactives per Active**



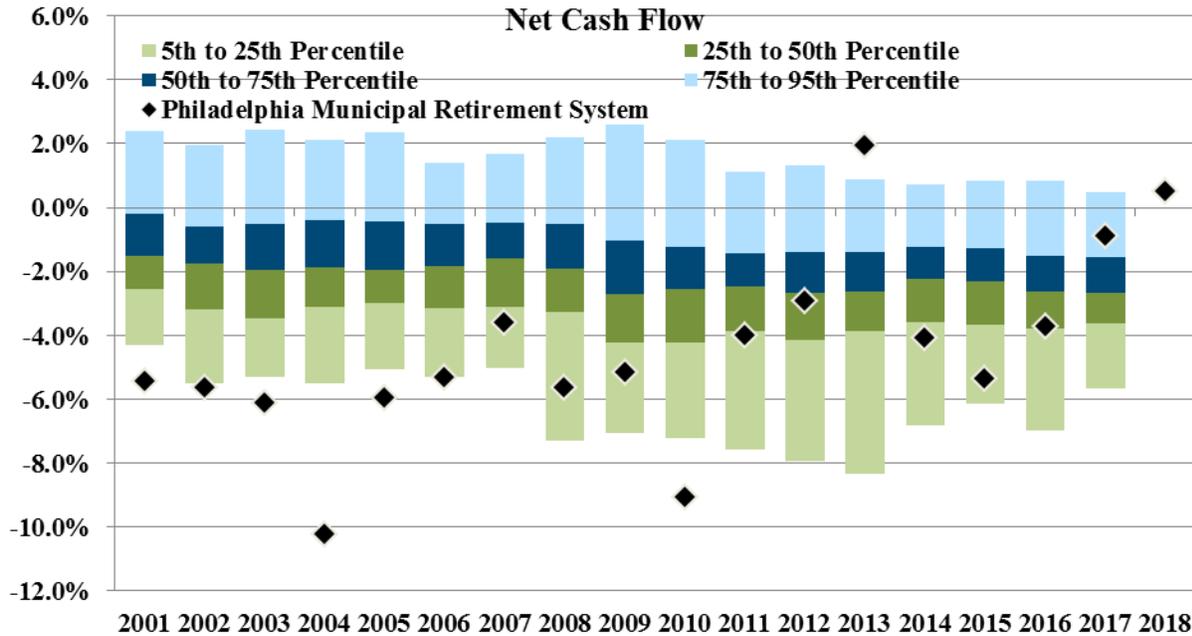
The chart above shows the distribution from the 5<sup>th</sup> to 95<sup>th</sup> percentile of support ratios for the plans in the Public Plans Database. The black diamond shows how the System compares. What this shows is that the System was already in a relatively mature status in 2001 while the other systems over this historic period grew more mature resulting in the System actually becoming more the norm. So as the average support ratio for other public plans has gradually increased over time, the support ratio for the System has been decreasing since 2012 and currently has a similar support ratio in 2018 as compared to 2001.

**Net Cash Flow**

The net cash flow of the plan as a percentage of the beginning of year assets indicates the sensitivity of the plan to short-term investment returns. Net cash flow is equal to contributions less benefit payments and administrative expenses. Mature plans can have large amounts of benefit payments compared to contributions, particularly if they are well funded. Investment losses in the short-term are compounded by the net withdrawal from the plan leaving a smaller asset base to try to recover from the investment losses. Large negative cash flows can also create liquidity issues.

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The chart above shows the distribution from the 5<sup>th</sup> to 95<sup>th</sup> percentile of net cash flow for the plans in the Public Plans Database. The black diamond shows how the System compares. Up until 2006, the System was consistently below the 5<sup>th</sup> percentile compared to the database of other public plans in terms of negative cash flow as a percentage of assets. In 2004, the net cash flow decreased down to -10.2% due to a PAF distribution. The decrease in 2010 was a result of the deferred contributions which were subsequently repaid in 2013, causing a positive net cash flow for that year. The steps taken by the City and participants in providing additional contributions to the System has reduced this cash flow risk significantly. In 2018, there was a positive cash flow which would likely put the System on the other side of the spectrum in the 95<sup>th</sup> percentile.

**Assessing Costs and Risks**

The fundamental risk to the System is that the contributions needed to fund the benefits become unaffordable. Assessing this risk, however, is complex because there is no bright line of what is unaffordable and the contribution amounts themselves are affected not just by the experience of the System, but also by the interaction of that experience and decisions by the Board related to assumptions, asset smoothing methods, and amortization periods.

**Deterministic Scenarios/Stress Testing**

This section illustrates stress testing of the investment return assumption and is an extension of the baseline results provided in the baseline projections in the Summary section. Under the baseline results, we assumed the ultimate 7.55% investment return assumption each and every year beginning July 1, 2019.

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For stress testing purposes, we developed six hypothetical scenarios to illustrate the impact actual investment returns may have on future funded status and contribution rates. The scenarios are balanced between positive and negative scenarios and are based on a normal distribution of one and five year expected returns as shown in the table below using the 10-year capital market assumptions from the System’s investment consultant as of February 2019 (Geometric return of 7.66%, standard deviation of 11.11%).

Distribution of Expected Average Annual Returns		
Percentile	1 Year	5 Year
5%	-10.6%	-0.5%
25%	0.2%	4.3%
50%	7.7%	7.7%
75%	15.2%	11.0%
95%	25.9%	15.8%

The scenarios include: a one-year shock using the 5th and 95th percentile returns for one year; a 5-year moderate scenario using the 25th and 75th percentile returns for five years; and a 5-year significant scenario using the 5th and 95th percentile returns for five years. A two-standard deviation event may seem like a very remote possibility, but the risk actually accumulates from year to year. The table below summarizes the theoretical scenarios.

FYE	Theoretical Scenarios					
	1-Yr Shock		5-Yr Moderate		5-Yr Significant	
	Neg	Pos	Neg	Pos	Neg	Pos
2019	-10.6%	25.9%	4.3%	11.0%	-0.5%	15.8%
2020	7.55%	7.55%	4.3%	11.0%	-0.5%	15.8%
2021	7.55%	7.55%	4.3%	11.0%	-0.5%	15.8%
2022	7.55%	7.55%	4.3%	11.0%	-0.5%	15.8%
2023	7.55%	7.55%	4.3%	11.0%	-0.5%	15.8%
2024+	7.55%	7.55%	7.55%	7.55%	7.55%	7.55%

The charts on the following pages show the projections over the next 20 years under each of these theoretical scenarios assuming the **City makes contributions on the RRP basis**. For each scenario we show two charts.

The top chart shows asset measures (green and blue lines) compared to liabilities (grey bars). At the top of each chart is the progression of the System’s funding ratio which compares the actuarial value of assets (blue lines) to the actuarial liability (grey bars).

Under the baseline RRP scenario assuming a 7.55% return assumption each and every year from the prior section, the System achieved fully funded by 2033. The stress testing of return expectations reveals insight from these charts as to how varying investment returns impact the System’s funding ratio.

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It is worth noting the 10-year asset smoothing method has significant influence on the smoothing of assets against market value volatility as well as the relatively slow funding progress. A single year or a couple of years of lower than expected returns can delay the System from becoming fully funded. While some of these losses are made up through required increased contribution payments, these scenarios also demonstrate the implications of negative cash flow.

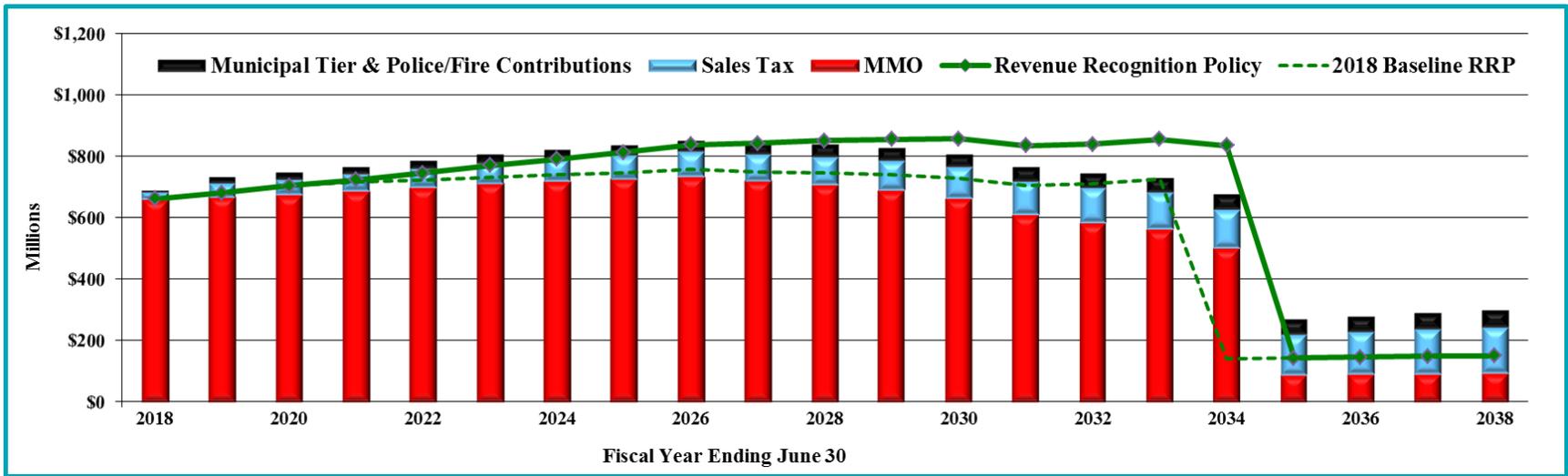
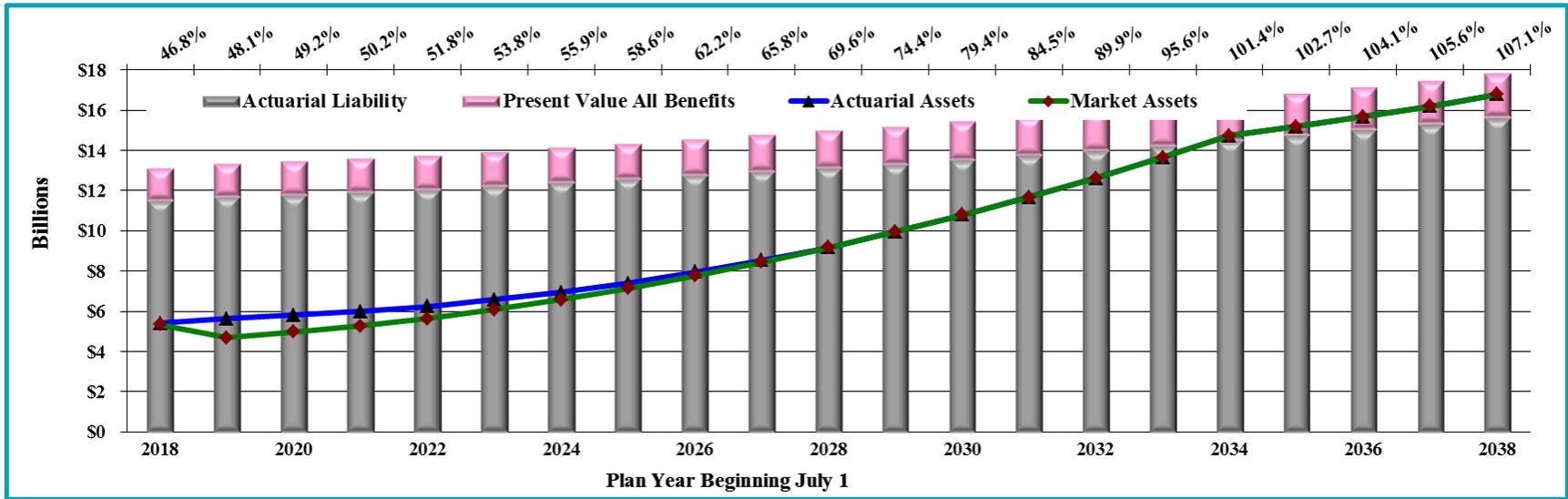
When a mature system pays out more than it receives in a year and returns are below the assumption, the assets that get paid out are no longer in the system during subsequent years of market recovery. So a system with significant negative cash flow coupled with investment return volatility will grow at a slower rate than the investment return assumption.

The bottom chart shows the MMO (red bars) including the impact on MMO reductions as a function of expected sales tax revenue (blue bars) and expected tiered and member contributions (black bars). The green line shows the expected City contributions under the RRP which includes the sales tax revenue and additional member contributions that are expected to be contributed on top of the MMO. Prior to 2016, the RRP is equal to the MMO. The dashed green line represents the expected RRP under the baseline projections to facilitate the comparison between the particular scenario and the baseline projections assuming all assumptions are met.

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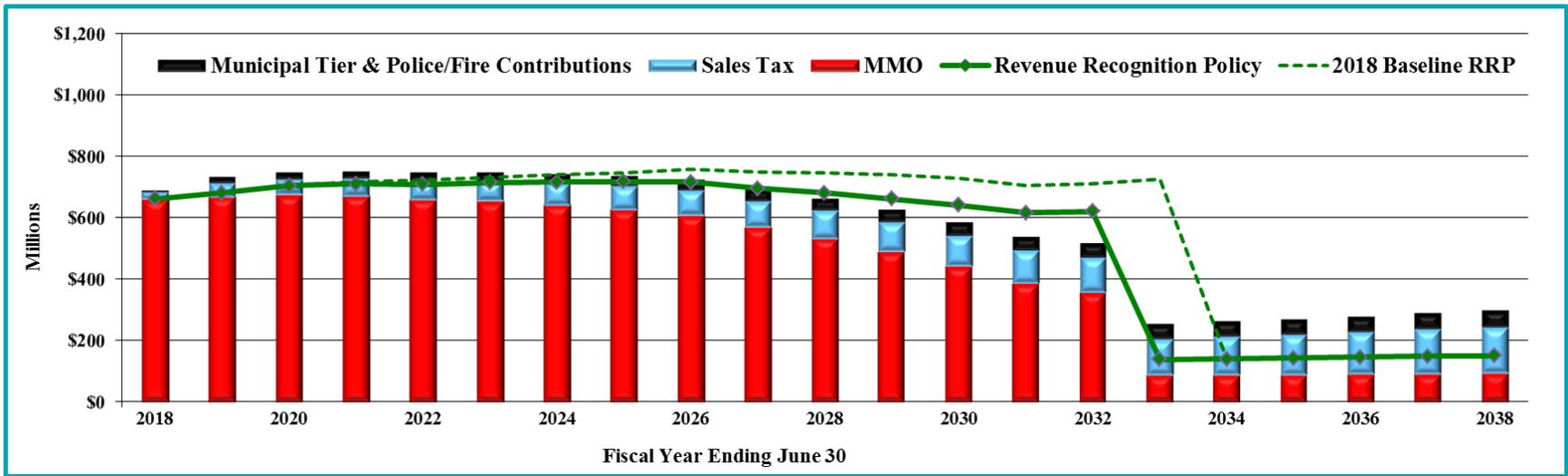
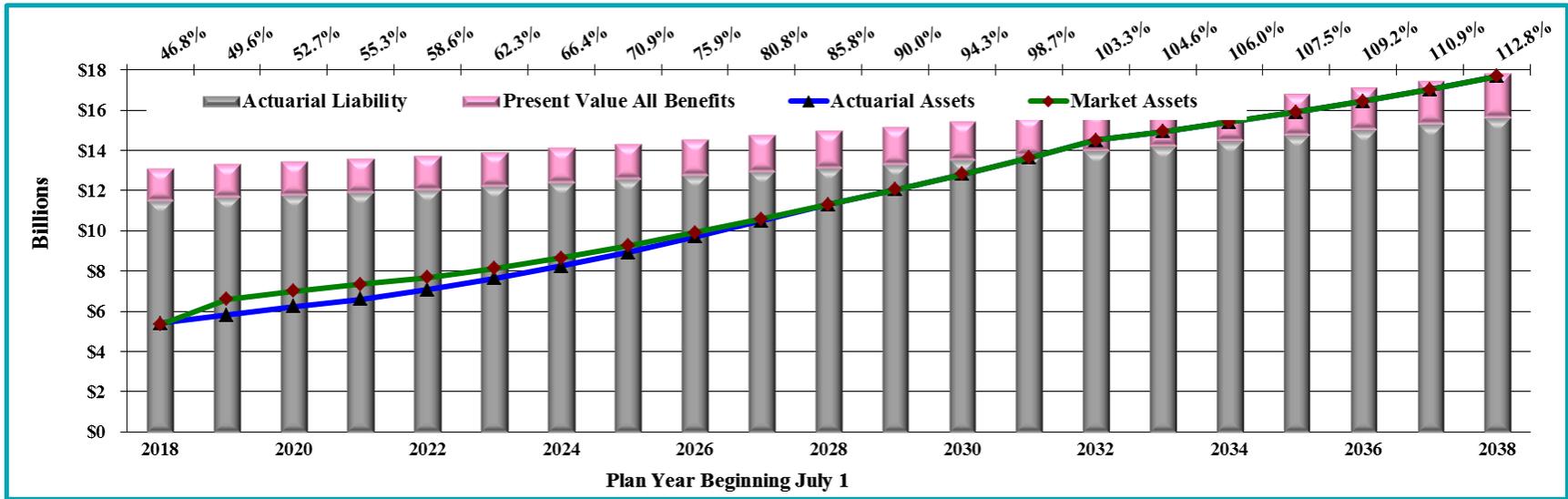
**One-Year Negative Shock Scenario: -10.6% return FYE 2019, 7.55% after**



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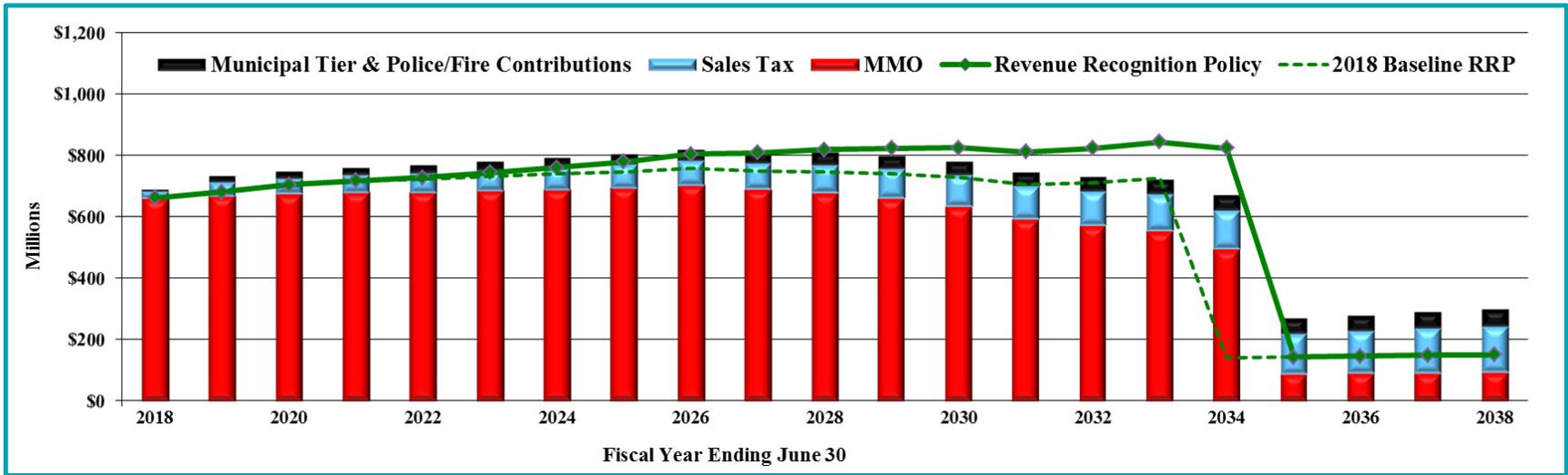
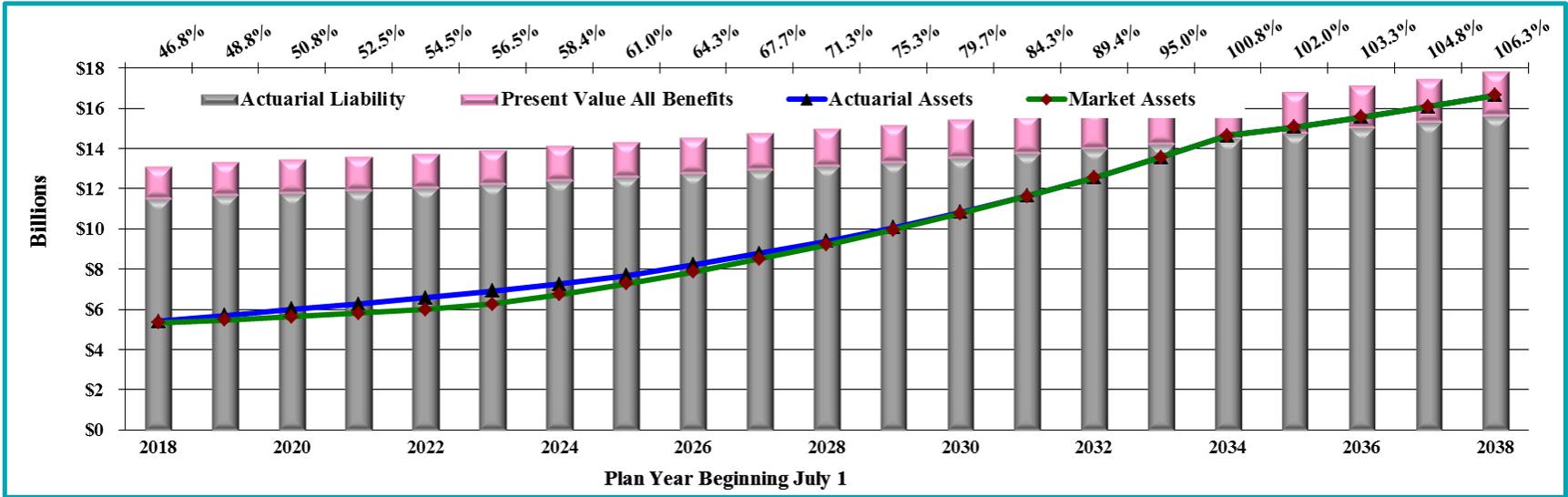
**One-Year Positive Shock Scenario: 25.9% return FYE 2019, 7.55% after**



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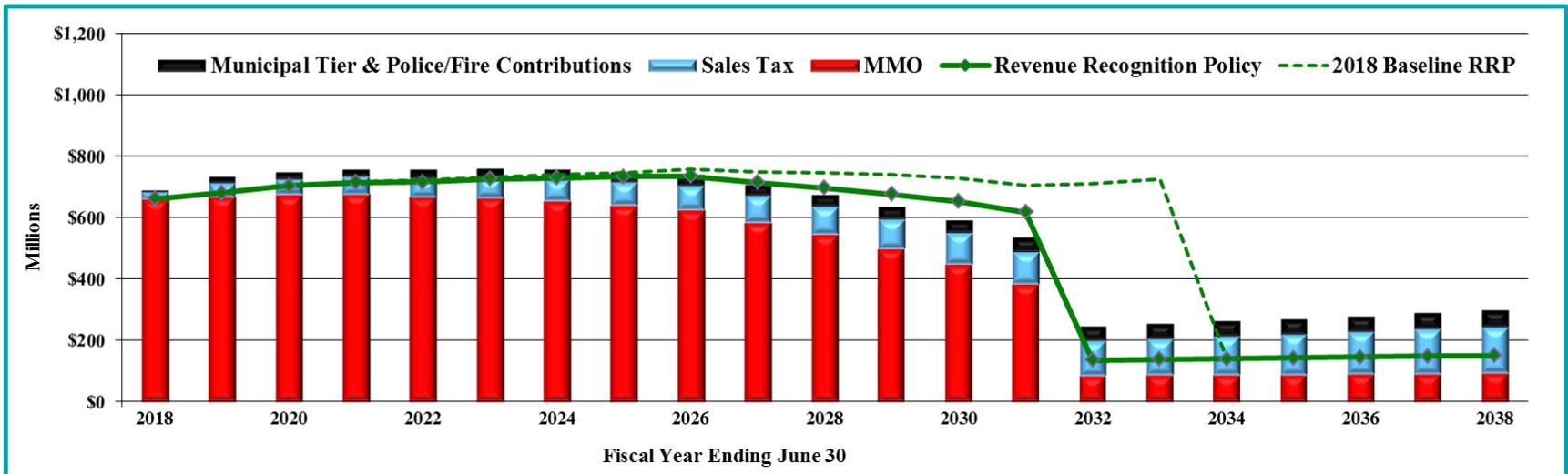
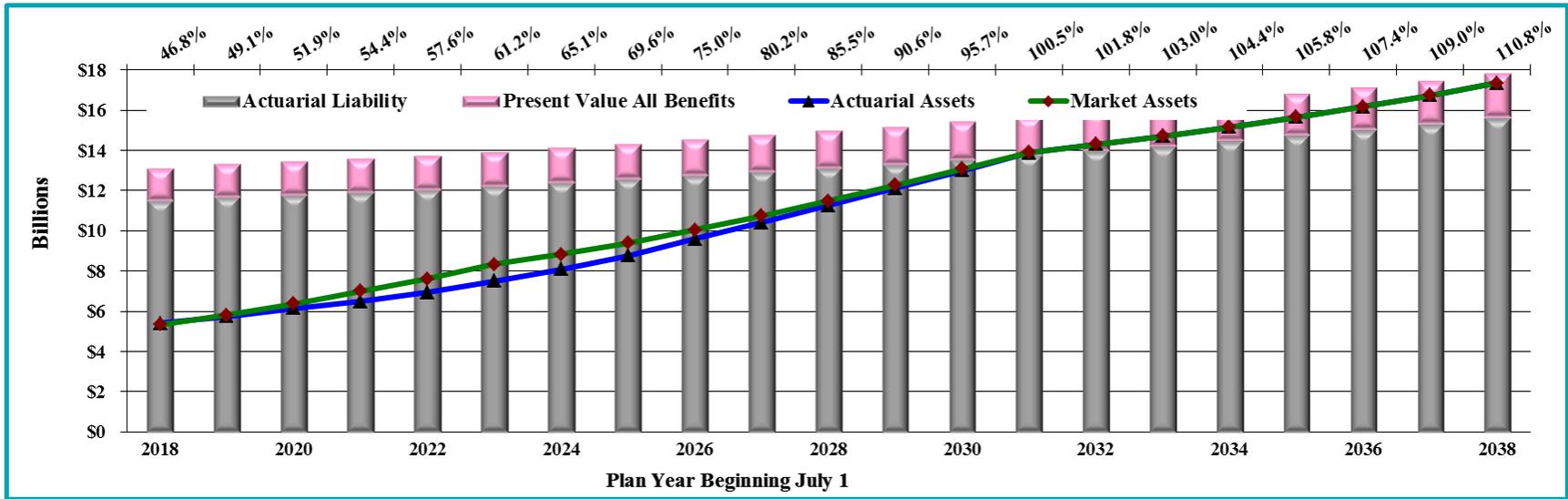
**Five-Year Moderate Negative Scenario: 4.3% return FYE 2019-2023, 7.55% after**



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**SECTION II – ASSESSMENT AND DISCLOSURE OF RISK**

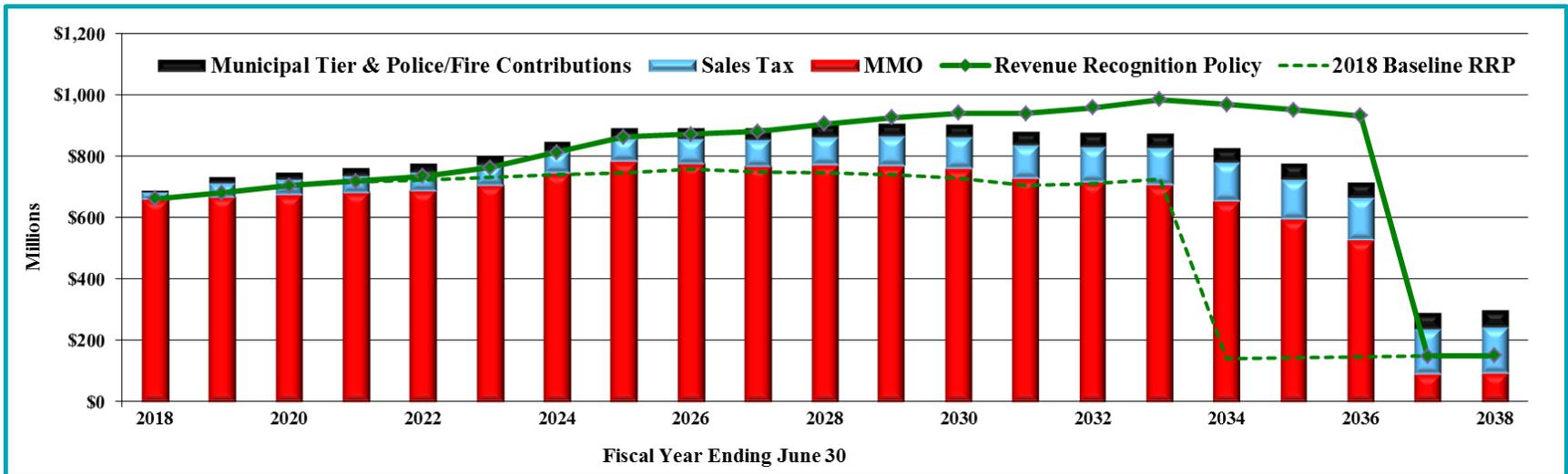
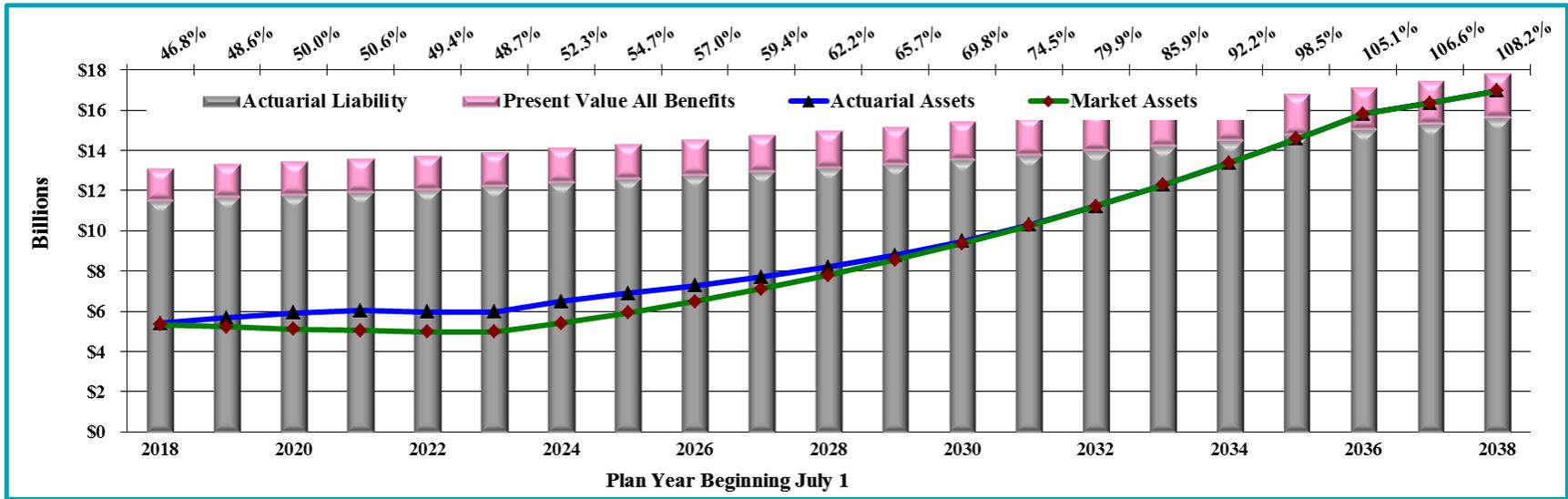
**Five-Year Moderate Positive Scenario: 11.0% return FYE 2019-2023, 7.55% after**



**CITY OF PHILADELPHIA MUNICIPAL RETIREMENT SYSTEM  
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**SECTION II – ASSESSMENT AND DISCLOSURE OF RISK**

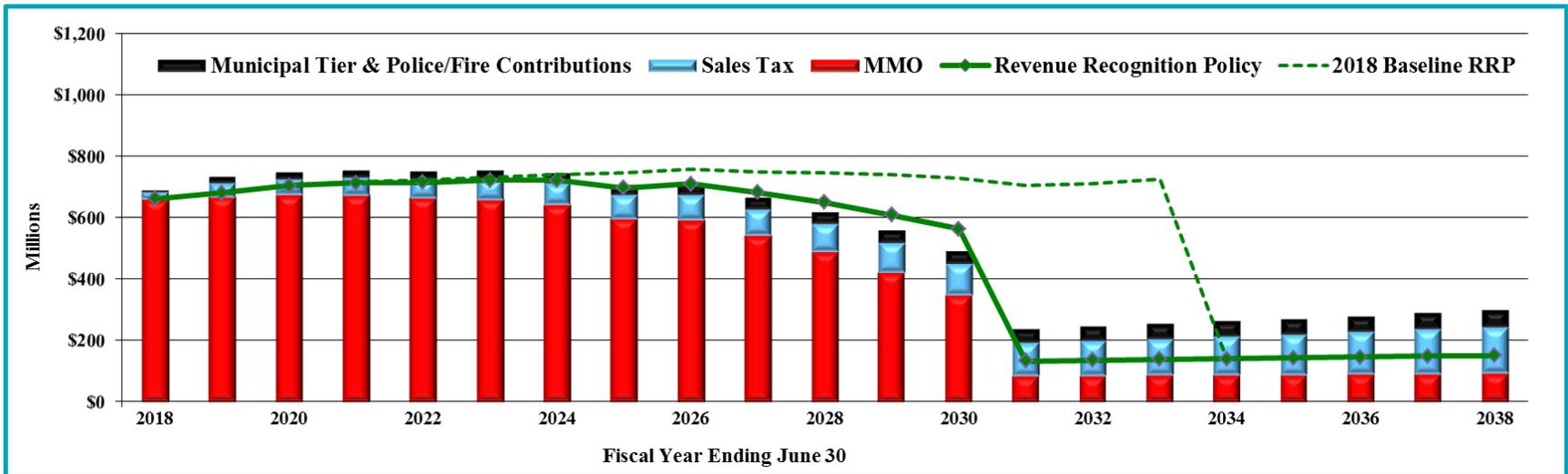
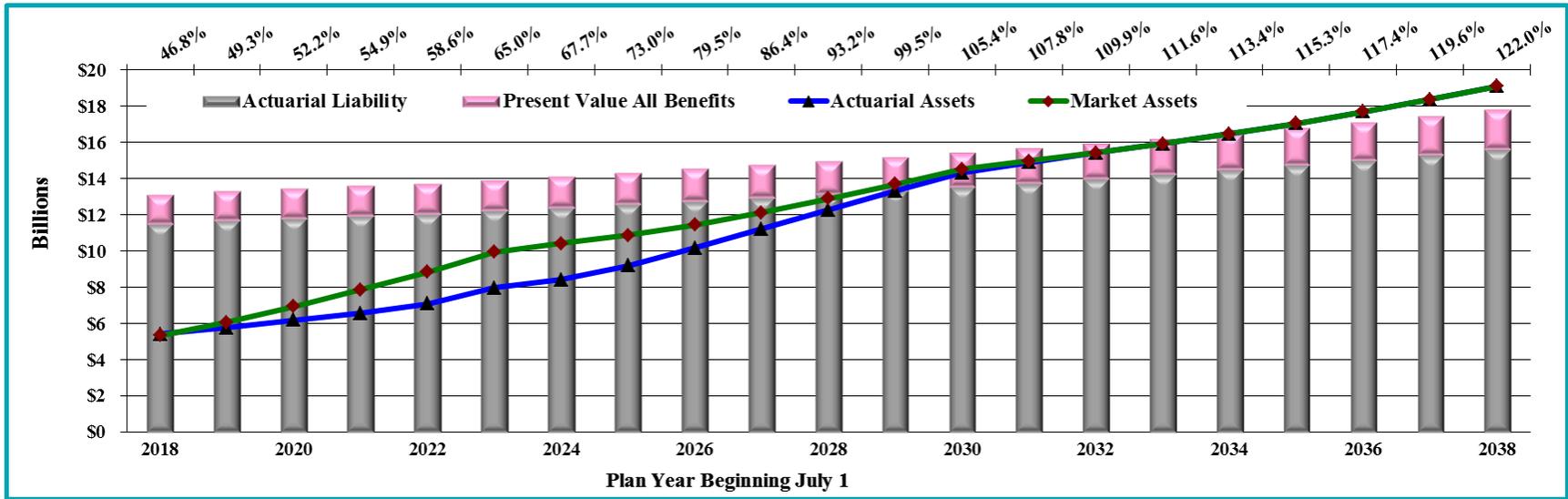
**Five-Year Significant Negative Scenario: -0.5% return FYE 2019–2023, 7.55% after**



**CITY OF PHILADELPHIA MUNICIPAL RETIREMENT SYSTEM  
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**SECTION II – ASSESSMENT AND DISCLOSURE OF RISK**

**Five-Year Significant Positive Scenario: 15.8% return FYE 2019-2023, 7.55% after**



**CITY OF PHILADELPHIA MUNICIPAL RETIREMENT SYSTEM  
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**SECTION II – ASSESSMENT AND DISCLOSURE OF RISK**

As illustrated in the charts above, varying returns have an impact on the computed City contributions, especially in the later projection years when the System is fully funded. However, the volatility is mitigated for two reasons, the 10-year smoothing of assets and 20-year amortization of experience gains and losses. This illustrates that the future contributions should be anticipated to be higher to adjust for the market volatility. Thus, the market volatility can prolong the period of paying down the unfunded when coupled with the impact of negative cash flows in down markets.

**The investment returns used in the projections above were selected solely to illustrate the impact of investment volatility on the pattern of funded status and City contributions. They are not intended to be predictive of actual future contributions or funded status or even to represent a realistic pattern of investment returns.**

**Stochastic Projections**

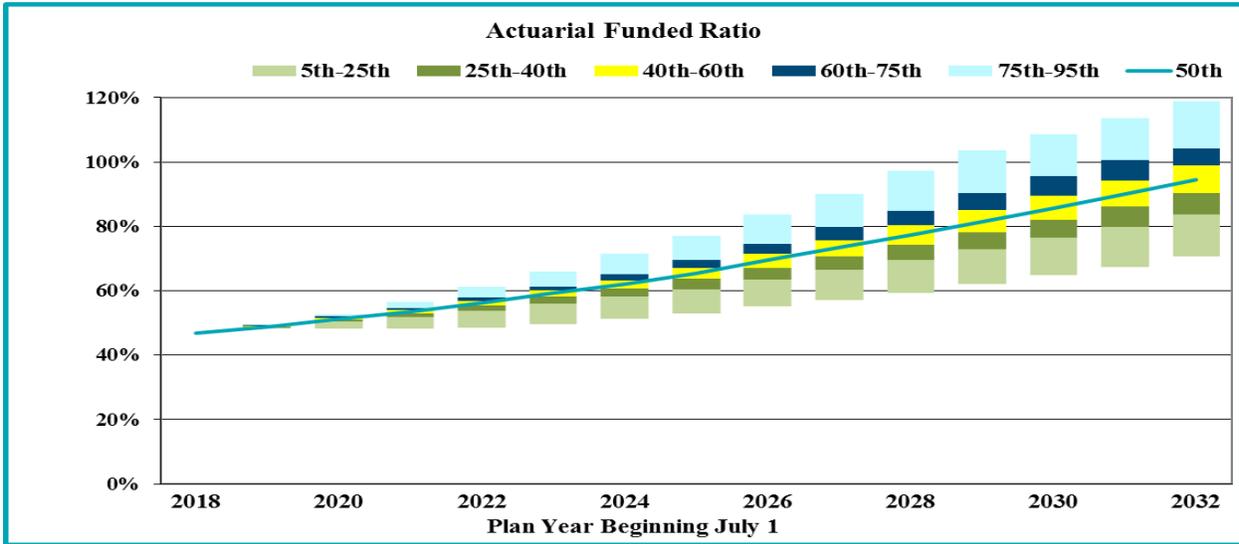
Stochastic Projections are used to provide a more realistic picture of what the likely future outcomes might be. Instead of a single projection, we use the expected long term average return allowing for the returns for each year to vary according to the expected volatility of asset returns based on the current asset allocation. The returns are determined randomly within acceptable ranges; we then perform 10,000 such projections over a 15 year period and accumulate the results. Accumulating this information allows us to present ranges of likely results.

The charts on the next page show the stochastic projection of the actuarial funded ratio and City contribution amounts under RRP. The blue line represents the most likely or average of the range of outcomes. The colored ranges represent potential results reflecting future asset return volatility. So the yellow bar around the blue line shows there is a 20% probability the actual ratio will fall within the range. The dark green and dark blue bars show that there is a 50% probability the actual results will fall within the ranges (25<sup>th</sup>-40<sup>th</sup> and 60<sup>th</sup>-75<sup>th</sup>). Finally, the light green and the light blue bars show that there is a 90% chance the actual results will fall within those ranges (5<sup>th</sup>-25<sup>th</sup> and 75<sup>th</sup>-95<sup>th</sup>). Another way to say this is there is a 10% chance the ratio could be above or below the projected range of ratios shown. There is increasing uncertainty in the actuarial funded ratio and level of City contributions depending on investment returns over time reflected in how broad the range gets.

**CITY OF PHILADELPHIA MUNICIPAL RETIREMENT SYSTEM  
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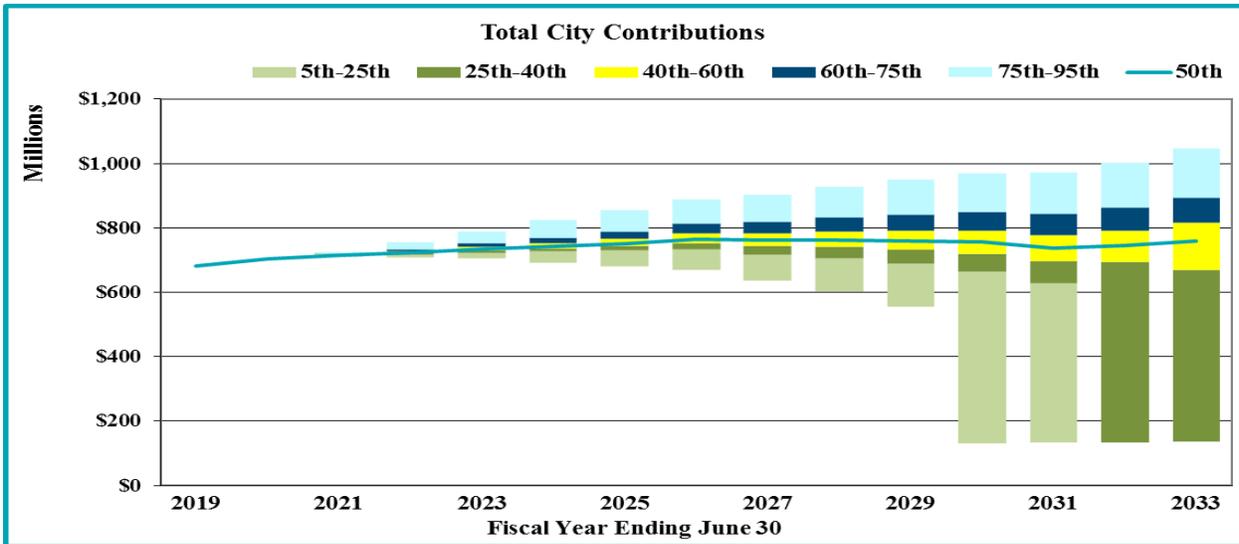
**SECTION II – ASSESSMENT AND DISCLOSURE OF RISK**

**Stochastic Projection of Actuarial Funded Ratio and City Contributions**



In the worst scenarios, the System’s actuarial funded ratio is just over 70% by 2032 based on poor investment returns. In the best scenarios, the System’s actuarial funded ratio reaches 120% by 2032.

In a similar process, we show the projected volatility of future City contributions.



In the worst scenarios, the City’s contribution amount could exceed \$1 billion by 2032. In the best scenarios, the City’s contribution could drop below \$150 million as early as 2030 which represents the System reaching 100% funded or greater at which time it drops to the normal cost rate. The significant cost reduction shows the potential when there are no more payments to fund the unfunded liability.

**CITY OF PHILADELPHIA MUNICIPAL RETIREMENT SYSTEM  
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**SECTION III – ASSETS**

The Retirement System uses and discloses two different asset measurements for funding, which are presented in this section of the report: market value and actuarial value of assets. The market value represents the value of the assets if they were liquidated on the valuation date and, unless explicitly stated otherwise, this value includes the Pension Adjustment Fund (PAF) which is not available for funding purposes. The actuarial value of assets is a value that smooths annual investment returns over ten years beginning in 2008 (five years before 2008) to reduce annual investment volatility and is used in determining contribution levels. This smoothing method also requires that the actuarial value of assets may not be more than 120% or less than 80% of the market value of assets. By definition, the actuarial value of assets does not include the PAF.

On the following pages, we present detailed information on the Retirement System’s assets:

- Disclosure of assets at July 1, 2017 and July 1, 2018,
- Statement of cash flows during the year,
- Development of the actuarial value of assets,
- Apportionment of assets between plans for valuation purposes,
- Development of the Pension Adjustment Fund as of July 1, 2018,
- Development of the actuarial value of assets for Revenue Recognition Policy, and
- Disclosure of investment performance for the year.

**A. Disclosure**

The market value of assets represents a “snap-shot” value as of the last day of the fiscal year that provides the principal basis for measuring financial performance from one year to the next. Market values, however, can fluctuate widely with corresponding swings in the value of the investments. Because these fluctuations would cause volatility in employer contributions, an actuarial value of assets is developed. Table III-1 on the following page presents the market value by asset class as of July 1, 2017 and July 1, 2018. Table III-2 presents the System’s net cash flows for the plan year beginning July 1, 2017 and ending June 30, 2018. Table III-3 presents Fiscal 2018 contributions received from the City and members of the System.

**CITY OF PHILADELPHIA MUNICIPAL RETIREMENT SYSTEM  
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**SECTION III – ASSETS**

<b>Table III-1</b>		
<b>Statement of Assets at Market Value*</b>		
	<b>7/1/2018</b>	<b>7/1/2017</b>
<b><u>Assets</u></b>		
Cash	\$ 14,542,295	\$ 15,077,026
Investments	5,208,327,049	4,812,767,551
Securities Lending	411,318,769	369,223,924
Accrued Interest and Other Receivables	238,879,825	193,774,643
Due from Other Governmental Units	<u>9,225,655</u>	<u>8,538,650</u>
<b>Total Assets</b>	<b>\$ 5,882,293,593</b>	<b>\$ 5,399,381,794</b>
<b><u>Liabilities</u></b>		
Due on Securities Lending	\$ 411,286,925	\$ 369,181,268
Accrued Expenses and Other Liabilities	<u>129,721,140</u>	<u>156,125,700</u>
<b>Total Liabilities</b>	<b>\$ 541,008,065</b>	<b>\$ 525,306,968</b>
<b>Net Assets</b>	<b>\$ 5,341,285,527</b>	<b>\$ 4,874,074,826</b>

\* Includes the PAF which is not available for funding purposes.

**CITY OF PHILADELPHIA MUNICIPAL RETIREMENT SYSTEM  
JULY 1, 2018 ACTUARIAL VALUATION**

**SECTION III – ASSETS**

**B. System Cash Flows for the Year July 1, 2017 through July 1, 2018**

<b>Table III-2</b>		
<b>Changes in Market Values<sup>1</sup></b>		
<b>Value of Assets – July 1, 2017</b>		<b>\$ 4,874,074,826</b>
<b><u>Additions</u></b>		
Contributions:		
Employer Contributions	\$ 781,984,326	
Employee Contributions	83,288,635	
Total Contributions		\$ 865,272,961
Investment Income:		
Appreciation in FV of Investments	\$ 318,229,513	
Interest and Dividends	127,784,903	
Total Investment Income	<u>\$ 446,014,416</u>	
Investment Activity Expenses:		
Investment Expenses	<u>(7,500,394)</u>	
Total Investment Activity Expenses	\$ (7,500,394)	
Securities Lending Activities:		
Securities Lending Income	\$ 1,836,151	
Securities Lending Expenses	<u>(274,649)</u>	
Net Income from Securities Lending Activities	\$ 1,561,502	
Miscellaneous Operating Revenues	\$ 251,264	
Net Investment Income		<u>440,326,788</u>
Total Additions		\$ 1,305,599,749
<b><u>Deductions</u></b>		
Administrative Expenses	\$ (10,123,004)	
Withdrawal Refunds	(8,498,915)	
Benefit Payments	(819,732,525)	
PAF Distributions	<u>(34,604)</u>	
Total Deductions		<u>(838,389,048)</u>
<b><u>Total</u></b>		
Net Increase (Decrease)		<u>467,210,701</u>
<b>Value of Assets – July 1, 2018</b>		<b>\$ 5,341,285,527</b>

<sup>1</sup> Includes the PAF which is not available for funding purposes

CITY OF PHILADELPHIA MUNICIPAL RETIREMENT SYSTEM  
JULY 1, 2018 ACTUARIAL VALUATION

SECTION III – ASSETS

Table III-3

Contributions for the Plan Year Ending June 30, 2018

**City Contributions**

Cash Received from City during Fiscal Year 2018	\$	731,864,934
Sales Tax Revenue		24,202,319
Cash Received from Quasi-Agencies		<u>25,917,073</u>
Total Cash Received from City during Fiscal Year 2018	\$	781,984,326

**Member Contributions**

Regular Member Contributions	\$	77,378,509
Tier Member Contributions (Municipal and Elected)		1,538,576
Additional Member Contributions (Police and Fire)		<u>4,371,550</u>
Total Member Contributions Received during Fiscal Year 2018	\$	83,288,635

**CITY OF PHILADELPHIA MUNICIPAL RETIREMENT SYSTEM  
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**SECTION III – ASSETS**

**C. Actuarial Value of Assets**

To determine on-going funding requirements, most pension systems utilize an actuarial value of assets that differs from the market value of assets. The actuarial value of assets represents an asset value based on averaging or smoothing year-to-year market value returns for purposes of reducing contribution volatility. Beginning with investment losses as of Fiscal Year End 2009, gains and losses are prospectively distributed in equal amounts over a ten-year period. The resulting asset value may not be more or less than 20% of the MVA.

<b>Table III-4 Development of Actuarial Value of Assets as of July 1, 2018</b>					
1. Market Value of Assets as of July 1, 2018					\$ 5,341,285,527
2. Pension Adjustment Fund (PAF) as of July 1, 2018 Before Additional Transfers					\$ 1,160,247
3. Market Value of Assets Net of Original PAF*					\$ 5,340,125,281
4. Deferred Asset Gains/(Losses)					
Fiscal Year Ending	Investment Gains / (Losses)	Percent Recognized	Percent Deferred	Amount Deferred	
2009	\$ (1,235,073,412)	100%	0%	\$ 0	
2010	200,524,637	90%	10%	20,052,464	
2011	414,187,915	80%	20%	82,837,583	
2012	(328,486,968)	70%	30%	(98,546,090)	
2013	127,718,278	60%	40%	51,087,311	
2014	347,082,935	50%	50%	173,541,468	
2015	(349,020,722)	40%	60%	(209,412,433)	
2016	(489,127,035)	30%	70%	(342,388,924)	
2017	242,673,428	20%	80%	194,138,743	
2018	79,312,820	10%	90%	71,381,538	
Total				\$ (57,308,340)	
5. Preliminary Actuarial Value as of July 1, 2018 (5 = 3 - 4)					\$ 5,397,433,621
6. Corridor for Actuarial Value					
a. 80% of Market Value Net of PAF					\$ 4,272,100,225
b. 120% of Market Value Net of PAF					\$ 6,408,150,337
7. Additional PAF Transfer as of July 1, 2018					\$ 0
8. Actuarial Value of Assets Net of Final PAF as of July 1, 2018 8 = max( min of 5 or 6b) and 6a), minus 7					\$ 5,397,433,621
9. As a percent of Market Value Net of Final PAF					101.1%
10. Market Value of Assets Net of Final PAF					\$ 5,340,125,281

\* Market value of assets net of original PAF before the determination of the final PAF amount. See section III - E for more details on the development of the total PAF and the additional PAF transfer, if applicable.

**CITY OF PHILADELPHIA MUNICIPAL RETIREMENT SYSTEM  
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**SECTION III – ASSETS**

**D. Apportionment of Actuarial Value of Assets**

The asset allocation reflects the actual cash flows for each plan and proportional allocation of investment earnings.

<b>Table III-5</b>										
<b>Allocation of Assets for Valuation Purposes Between Plans as of July 1, 2018</b>										
(\$ thousands)										
	<b>1967 Plan</b>			<b>1987 Plan</b>				<b>Plan '10</b>	<b>Plan '16</b>	<b>Total</b>
	<b>Municipal</b>	<b>Police</b>	<b>Fire</b>	<b>Municipal</b>	<b>Elected</b>	<b>Police</b>	<b>Fire</b>	<b>Municipal</b>	<b>Municipal</b>	
1. Actuarial Value of Assets as of July 1, 2017	\$ 1,425,691	\$ 522,495	\$ 179,058	\$ 1,349,865	\$ 12,909	\$ 1,252,508	\$ 361,344	\$ 3,905	\$ 844	\$ 5,108,619
2. Transactions During Plan Year July 1, 2017 to June 30, 2018										
a. Contributions										
City and Commonwealth Employees	\$ 334,348	\$ 174,088	\$ 73,093	\$ 88,333	\$ 1,543	\$ 61,366	\$ 20,867	\$ 935	\$ 1,495	\$ 756,067
Quasi-Public Agencies	4,614	1,598	526	33,503	418	29,554	9,312	2,123	1,640	83,289
	21,544	0	0	4,085	0	0	0	61	227	25,917
b. Benefit Payments	(422,657)	(211,572)	(86,483)	(54,027)	(1,647)	(34,687)	(8,661)	0	0	(819,733)
c. Withdrawals	(1,565)	(542)	(204)	(3,869)	(12)	(1,957)	(316)	0	(35)	(8,499)
d. Administrative Expenses	(3,225)	(1,401)	(480)	(3,270)	(7)	(1,062)	(386)	(200)	(92)	(10,123)
e. Net Transactions	\$ (66,941)	\$ (37,829)	\$ (13,548)	\$ 64,755	\$ 295	\$ 53,214	\$ 20,816	\$ 2,919	\$ 3,235	\$ 26,918
3. Total Fund Balance Prior to Allocation of Investment Income [1. + 2e.]	\$ 1,358,750	\$ 484,666	\$ 165,510	\$ 1,414,620	\$ 13,204	\$ 1,305,722	\$ 382,160	\$ 6,824	\$ 4,079	\$ 5,135,537
4. Investment Income During Plan Year July 1, 2017 to June 30, 2018	\$ 69,292	\$ 24,716	\$ 8,441	\$ 72,141	\$ 673	\$ 66,588	\$ 19,489	\$ 348	\$ 208	\$ 261,896
5. Preliminary Actuarial Value of Assets as of July 1, 2018 [3. + 4.]	\$ 1,428,042	\$ 509,384	\$ 173,951	\$ 1,486,760	\$ 13,878	\$ 1,372,310	\$ 401,650	\$ 7,171	\$ 4,287	\$ 5,397,434
6. Allocation of PAF Transfer	\$ 0	\$ 0	\$ 0	\$ 0	\$ 0	\$ 0	\$ 0	\$ 0	\$ 0	\$ 0
7. Final Actuarial Value of Assets With Corridor as of July 1, 2018	\$ 1,428,042	\$ 509,384	\$ 173,951	\$ 1,486,760	\$ 13,878	\$ 1,372,310	\$ 401,650	\$ 7,171	\$ 4,287	\$ 5,397,434
8. Final Actuarial Value of Assets Less RRP Additional Revenue Account	\$ 1,411,344	\$ 503,428	\$ 171,917	\$ 1,469,376	\$ 13,716	\$ 1,356,264	\$ 396,954	\$ 7,087	\$ 4,236	\$ 5,334,322

Note: Numbers may not add due to rounding

**CITY OF PHILADELPHIA MUNICIPAL RETIREMENT SYSTEM  
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**SECTION III – ASSETS**

**E. Development of the Pension Adjustment Fund as of July 1, 2018**

This table provides the funds available for distribution consideration under title §22-311 of the Philadelphia Code. In general, the Pension Adjustment Fund (PAF) provides for additional benefit distributions to retirees and beneficiaries through the use of excess earnings. This may include a lump-sum bonus payment, monthly pension increases, ad-hoc cost of living adjustments, or other increases determined by the Board. The adjusted market value of assets reflects a five-year smoothing of asset gains and losses, as described in the Philadelphia Code.

<b>Table III-6 Development of the Pension Adjustment Fund as of July 1, 2018</b>		
1. PAF on July 1, 2017	\$	1,097,499
2. PAF Distribution		(34,604)
3. Market Value Asset Return Through June 30, 2018 *		9.01%
4. PAF on July 1, 2018 Before Additional Transfers** =(1) x [1 + (3)] + (2)	\$	1,160,247
5. Adjusted Market Value of Assets Through June 30, 2018	\$	5,396,525,926
6. Adjusted Market Value of Assets Return Through June 30, 2018 ***		6.47%
7. Return in Excess of Investment Assumption Plus 1.0%, Limited to 5.0% =(6) - [7.65% + 1.00%]		0.00%
8. Additional Transfer as of July 1, 2018 =50% of (7) x (5)	\$	0
9. Total PAF as of July 1, 2018 = (4) + (8)	\$	1,160,247

\* Market Value Asset Return including the PAF

\*\* Calculations are based upon the unrounded percents for items (3) and (7)

\*\*\* Asset Return based upon the Adjusted Market Value of Assets using a 5 year smoothing of the gains/losses as outlined in Title 22-311

**CITY OF PHILADELPHIA MUNICIPAL RETIREMENT SYSTEM  
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**SECTION III – ASSETS**

**F. Actuarial Value of Assets for Revenue Recognition Policy**

The System is expected to receive additional revenue from sales tax, tier member contributions and additional member contributions, which is anticipated to be contributed over and above the City’s contribution of the MMO. These additional sources of revenue are tracked separately and accumulated in a notional account. For determining the actuarial value of assets for the RRP, the additional revenue account is excluded from the assets. Below is the development of the assets used for the RRP.

<b>Table III-7 Actuarial Value of Assets for Revenue Recognition Policy as of July 1, 2018</b>	
1. Additional Revenue Account on July 1, 2017	\$30,032,925
2. Sales Tax Revenue Received During FYE June 30, 2018	\$24,202,319
3. Tier and Additional Member Contributions Received During FYE June 30, 2018*	5,910,126
4. Market Value Asset Return Through June 30, 2018	9.01%
5. Interest Through June 30, 2018	2,966,218
6. Additional Revenue Account on July 1, 2018 =(1) + (2) + (3) + (5)	\$63,111,588
7. Actuarial Value of Assets on June 30, 2018	\$5,397,433,621
8. Actuarial Value of Assets Net of Additional Revenue on June 30, 2018** =(7) - (6)	\$5,334,322,033

\* Tier and additional member contributions are assumed to be received mid-year.

Actual date of receipt is used for sales tax revenue contribution

\*\* Actuarial Value of Assets used in calculation of the RRP contribution is net of accumulated sales tax revenue and tier and additional member contributions

**CITY OF PHILADELPHIA MUNICIPAL RETIREMENT SYSTEM  
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**SECTION III – ASSETS**

**G. Investment Performance**

The market value of assets internal rate of return was 9.01% for the year ending June 30, 2018. This is compared to an assumed return of 7.65% for the same period. This return produced an overall investment gain of \$79.3 million for the year ending June 30, 2018. On an actuarial value of assets basis (net of PAF), the return for FYE 2018 was 5.11%. In the table below, we also provide returns from two broad asset classes for comparison.

<b>Table III-8 Annual Rates of Return</b>					
<b>Year Ending <u>June 30,</u></b>	<b>Investment Return <u>Assumption</u></b>	<b>Market Value</b>	<b>Actuarial Value *</b>	<b>Total Return Standard &amp; Poor's <u>500 Index</u></b>	<b>Barclays Aggregate <u>Bond Index**</u></b>
1995	9.00%	11.70%	7.80%	26.10%	12.80%
1996	9.00%	15.10%	10.10%	26.00%	4.70%
1997	9.00%	18.30%	12.20%	34.60%	8.20%
1998	9.00%	14.30%	13.10%	30.20%	10.50%
1999	9.00%	10.00%	13.10%	22.70%	3.10%
2000	9.00%	9.60%	11.10%	7.30%	4.60%
2001	9.00%	-6.00%	8.30%	-14.80%	11.20%
2002	9.00%	-5.80%	3.40%	-18.00%	8.60%
2003	9.00%	1.80%	-2.20%	0.30%	10.40%
2004	9.00%	16.60%	4.60%	19.10%	0.30%
2005	8.75%	9.90%	1.80%	6.31%	6.81%
2006	8.75%	11.30%	6.10%	8.60%	-0.80%
2007	8.75%	16.98%	10.71%	20.60%	6.10%
2008	8.75%	-4.53%	10.13%	-13.10%	7.10%
2009	8.75%	-19.87%	-9.28%	-26.21%	5.98%
2010	8.25%	13.81%	12.89%	14.40%	9.19%
2011	8.15%	19.40%	9.90%	28.13%	3.56%
2012	8.10%	0.18%	2.42%	3.14%	7.30%
2013	7.95%	10.94%	5.08%	17.91%	-0.85%
2014	7.85%	15.70%	4.81%	22.04%	4.36%
2015	7.80%	0.29%	5.80%	5.25%	1.86%
2016	7.75%	-3.17%	4.45%	1.73%	6.00%
2017	7.70%	13.08%	4.40%	15.46%	-0.31%
2018	7.65%	9.01%	5.11%	12.17%	-0.39%

\* Net of PAF

**CITY OF PHILADELPHIA MUNICIPAL RETIREMENT SYSTEM  
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**SECTION III – ASSETS**

**H. Asset Gain/(Loss)**

There was a \$79.3 million investment gain on market value of assets when compared to the expected as of July 1, 2018. Table III-9 reconciles the 2018 asset gain (expected versus actual) for the market value of assets both net of the PAF and in total. This investment gain is smoothed over a ten-year period to determine the actuarial value of assets (see Table III – 4). Also provided below is a reconciliation of the PAF.

<b>Table III-9 Calculation of Asset Gain/(Loss)</b>			
	<b>Market Value (Net of PAF)</b>	<b>PAF</b>	<b>Total Market Value</b>
1. Market Value of Assets as of July 1, 2017	\$ 4,872,977,327	\$ 1,097,499	\$ 4,874,074,826
2. Transactions During Plan Year July 1, 2017 to June 30, 2018			
a. Contributions			
City and Commonwealth	\$ 756,067,253	\$ 0	\$ 756,067,253
Employees	83,288,635	0	83,288,635
Quasi-Public Agencies	25,917,073	0	25,917,073
b. Benefit Payments	(819,732,525)	(34,604)	(819,767,129)
c. Withdrawals	(8,498,915)	0	(8,498,915)
d. Administrative Expenses	(10,123,004)	0	(10,123,004)
e. Net Transactions	\$ 26,918,517	\$ (34,604)	\$ 26,883,913
3. Expected Investment Income from July 1, 2017 to June 30, 2018	\$ 360,916,618	\$ 97,351 *	\$ 361,013,969
4. PAF transfer at July 1, 2018	\$ 0	\$ 0	\$ 0
5. Expected Market Value of Assets as of July 1, 2018 [1. + 2.e. + 3. + 4]	\$ 5,260,812,461	\$ 1,160,247	\$ 5,261,972,708
6. Market Value of Assets as of July 1, 2018	\$ 5,340,125,281	\$ 1,160,247	\$ 5,341,285,528
7. Investment Gain/(Loss) [6. - 5.]	\$ 79,312,820	\$ 0	\$ 79,312,820

\* The PAF is credited with investment income at the market rate of return earned by plan assets.

**CITY OF PHILADELPHIA MUNICIPAL RETIREMENT SYSTEM  
JULY 1, 2018 ACTUARIAL VALUATION**

**SECTION IV – LIABILITIES**

In this section, we present detailed information on liabilities for the City of Philadelphia Municipal Retirement System, including:

- Disclosure of liabilities at July 1, 2017 and July 1, 2018,
- Statement of changes in these liabilities and the unfunded liabilities during the year,
- Development of the normal cost rates by plan, and
- The reconciliation of the changes in the unfunded liability by plan as well as the expected unfunded liability as of July 1, 2019.

**Disclosure**

Two types of liabilities are calculated and presented in this report. Each type is distinguished by the purpose for which the figures are ultimately used.

- **Present Value of all Future Benefits:** Used for measuring all future obligations, this represents the amount of money needed today to fully fund all benefits both earned as of the valuation date and those to be earned in the future by current plan participants, under the current plan provisions and assumptions.
- **Actuarial Liability:** Used for determining employer contributions and GASB accounting disclosures. This liability is calculated by subtracting the present value of future member contributions and future employer normal cost contributions as determined under the Entry Age Normal Cost (EAN) actuarial funding method from the present value of all future benefits.

These liabilities are for funding purposes and are not appropriate for measuring the cost of settling plan liabilities by purchasing annuities or paying lump sums.

**CITY OF PHILADELPHIA MUNICIPAL RETIREMENT SYSTEM  
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**SECTION IV – LIABILITIES**

Table III-1 shows the present value of future benefits, actuarial liability, and unfunded actuarial liability as of July 1, 2018, and July 1, 2017, for the Retirement System.

<b>Table IV-1 Disclosure of Liabilities (\$ thousands)</b>		
	<b>July 1, 2018</b>	<b>July 1, 2017</b>
<b>Present Value of Future Benefits</b>		
Actives	\$ 5,516,023	\$ 5,149,988
Terminated Vesteds	104,765	111,367
Disabled	782,082	758,314
Retirees	5,119,142	5,038,627
Beneficiaries	672,900	651,804
DROP Account plus Deferred Annuities	909,297	807,195
Non-Vested Refunds	8,470	8,274
<b>Total City PVFB</b>	<b>\$ 13,112,679</b>	<b>\$ 12,525,569</b>
Market Value of Assets (Net of PAF)	(5,340,125)	(4,872,977)
Present Value Future Member Contrib.	(872,893)	(602,656)
<b>City's Unfunded Future Obligation</b>	<b>\$ 6,899,661</b>	<b>\$ 7,049,936</b>
<b>Actuarial Liability</b>		
Actives	\$ 3,924,324	\$ 3,900,095
Terminated Vesteds	104,765	111,367
Disabled	782,082	758,314
Retirees	5,119,142	5,038,627
Beneficiaries	672,900	651,804
DROP	909,297	807,195
Non-Vested Refunds	8,470	8,274
<b>Total City AL</b>	<b>\$ 11,520,980</b>	<b>\$ 11,275,676</b>
Actuarial Value of Assets	(5,397,434)	(5,108,619)
<b>Unfunded Actuarial Liability</b>	<b>\$ 6,123,546</b>	<b>\$ 6,167,057</b>

**CITY OF PHILADELPHIA MUNICIPAL RETIREMENT SYSTEM  
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**SECTION IV – LIABILITIES**

Table IV-2 shows the present value of future benefits, actuarial liability, and unfunded actuarial liability for each Plan in the Retirement System.

Table IV-2 Liabilities Detail as of July 1, 2018 (\$ thousands)										
	1967 Plan			1987 Plan				Plan '10	Plan '16	Total
	Municipal	Police	Fire	Municipal	Elected	Police	Fire	Municipal	Municipal	
<b>Present Value of Future Benefits</b>										
Actives	\$ 552,250	\$ 182,291	\$ 56,917	\$ 2,178,390	\$ 18,421	\$ 1,834,919	\$ 623,824	\$ 38,287	\$ 30,723	\$ 5,516,023
Terminated Vesteds	33,861	139	0	56,580	0	12,180	2,005	0	0	104,765
Disabled	219,090	184,260	42,466	103,143	0	198,926	34,197	0	0	782,082
Retirees	2,726,960	1,305,366	569,414	329,414	10,784	136,134	41,071	0	0	5,119,142
Beneficiaries	338,734	178,986	77,361	39,851	631	27,112	10,226	0	0	672,900
DROP	439,465	139,754	53,585	141,272	1,503	105,170	28,548	0	0	909,297
Non-Vested Refunds	1,605	156	72	5,460	10	905	262	0	0	8,470
<b>Total PVFB</b>	\$ 4,311,965	\$ 1,990,952	\$ 799,815	\$ 2,854,110	\$ 31,350	\$ 2,315,346	\$ 740,133	\$ 38,287	\$ 30,723	\$ 13,112,679
<b>Actuarial Liability</b>										
Actives	\$ 521,106	\$ 168,292	\$ 52,735	\$ 1,589,016	\$ 15,408	\$ 1,193,853	\$ 372,620	\$ 8,015	\$ 3,280	\$ 3,924,324
Terminated Vesteds	33,861	139	0	56,580	0	12,180	2,005	0	0	104,765
Disabled	219,090	184,260	42,466	103,143	0	198,926	34,197	0	0	782,082
Retirees	2,726,960	1,305,366	569,414	329,414	10,784	136,134	41,071	0	0	5,119,142
Beneficiaries	338,734	178,986	77,361	39,851	631	27,112	10,226	0	0	672,900
DROP	439,465	139,754	53,585	141,272	1,503	105,170	28,548	0	0	909,297
Non-Vested Refunds	1,605	156	72	5,460	10	905	262	0	0	8,470
<b>Total AL</b>	\$ 4,280,821	\$ 1,976,953	\$ 795,633	\$ 2,264,736	\$ 28,337	\$ 1,674,280	\$ 488,929	\$ 8,015	\$ 3,280	\$ 11,520,980
Actuarial Value of Assets	(1,428,042)	(509,384)	(173,951)	(1,486,760)	(13,878)	(1,372,310)	(401,650)	(7,171)	(4,287)	(5,397,434)
<b>Unfunded Actuarial Liability</b>	\$ 2,852,779	\$ 1,467,569	\$ 621,682	\$ 777,976	\$ 14,459	\$ 301,970	\$ 87,279	\$ 844	\$ (1,007)	\$ 6,123,546
<b>Funding Percent</b>	33.4%	25.8%	21.9%	65.6%	49.0%	82.0%	82.1%	89.5%	130.7%	46.8%

Note: Numbers may not add due to rounding.

**CITY OF PHILADELPHIA MUNICIPAL RETIREMENT SYSTEM  
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**SECTION IV – LIABILITIES**

Table IV-3 shows the derivation of the City normal cost as a percent of pay for each Plan in the System under the MMO basis.

<b>Table IV-3</b>										
<b>Derivation of the Normal Cost as of July 1, 2018</b>										
<b>(\$ thousands)</b>										
	<b>1967 Plan</b>			<b>1987 Plan</b>				<b>Plan '10</b>	<b>Plan '16</b>	<b>Total</b>
	<b>Municipal</b>	<b>Police</b>	<b>Fire</b>	<b>Municipal</b>	<b>Elected</b>	<b>Police</b>	<b>Fire</b>	<b>Municipal</b>	<b>Municipal</b>	
Retirement	\$ 3,267	\$ 2,806	\$ 887	\$ 41,078	\$ 310	\$ 41,537	\$ 16,209	\$ 1,706	\$ 1,837	\$ 109,638
Death	157	96	32	2,706	20	2,118	876	139	153	6,297
Disability	439	507	156	6,788	33	10,511	4,056	472	354	23,315
Termination	3,565	284	83	22,600	161	4,505	1,554	960	1,058	34,772
Administrative Expenses	2,992	1,307	447	3,092	7	1,065	380	213	230	9,734
<b>Total Normal Cost (with Expenses)</b>	<b>\$ 10,420</b>	<b>\$ 5,000</b>	<b>\$ 1,605</b>	<b>\$ 76,264</b>	<b>\$ 532</b>	<b>\$ 59,737</b>	<b>\$ 23,075</b>	<b>\$ 3,490</b>	<b>\$ 3,633</b>	<b>\$ 183,756</b>
Expected Employee Contributions	\$ 5,059	\$ 1,388	\$ 437	\$ 41,546	\$ 438	\$ 32,959	\$ 12,479	\$ 1,743	\$ 2,207	\$ 98,256
City Normal Cost	\$ 5,361	\$ 3,612	\$ 1,168	\$ 34,718	\$ 94	\$ 26,777	\$ 10,595	\$ 1,747	\$ 1,425	\$ 85,497
Current Annual Payroll	\$ 83,618	\$ 23,134	\$ 7,288	\$ 917,941	\$ 3,298	\$ 467,223	\$ 173,915	\$ 74,811	\$ 54,172	\$ 1,805,400
City Normal Cost as % of Pay, Beginning of Year Payment	6.412%	15.613%	16.026%	3.782%	2.849%	5.731%	6.092%	2.335%	2.631%	4.736%
City Normal Cost as % of Pay, End of Year Payment	6.899%	16.800%	17.244%	4.070%	3.065%	6.167%	6.555%	2.512%	2.831%	5.096%

Note: Numbers may not add due to rounding.

**CITY OF PHILADELPHIA MUNICIPAL RETIREMENT SYSTEM  
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**SECTION IV – LIABILITIES**

Table IV-4 shows changes in the unfunded actuarial liability from July 1, 2017 to July 1, 2018 due to actuarial experience and assumption changes. The plan changes to future member contributions have no impact on the UAL. The table also shows the development of the expected unfunded actuarial liability from July 1, 2018 to July 1, 2019 based upon the City’s Funding Policy, which is used to develop the end of year amortization amounts for the City’s Funding Policy in Table V – 10 and in Appendix B. The actuarial experience of each of the plans is calculated based on the plans’ actual asset and liability values compared to the expected values.

Table IV-4 Expected Unfunded Actuarial Liability for the Plan Year Ending June 30, 2019 (\$ thousands)										
	1967 Plan			1987 Plan				Plan '10	Plan '16	Total
	Municipal	Police	Fire	Municipal	Elected	Police	Fire	Municipal	Municipal	
1. Expected Unfunded Actuarial Liability (UAL) as of July 1, 2018 Based on July 1, 2017 Valuation*	\$ 2,621,458	\$ 1,351,790	\$ 577,217	\$ 625,584	\$ 14,283	\$ 327,008	\$ 93,363	\$ 397	\$ (207)	\$ 5,610,893
2. Changes in UAL due to										
a. Actuarial Experience	\$ 196,158	\$ 117,046	\$ 44,925	\$ 47,722	\$ (345)	\$ 34,014	\$ 13,875	\$ (221)	\$ (831)	\$ 452,343
b. Assumption Changes	35,162	(1,266)	(461)	104,670	520	(59,053)	(19,959)	668	32	60,314
c. Active Plan Changes	0	0	0	0	0	0	0	0	0	0
d. Inactive Plan Changes	0	0	0	0	0	0	0	0	0	0
e. Subtotal	\$ 231,320	\$ 115,780	\$ 44,464	\$ 152,392	\$ 175	\$ (25,039)	\$ (6,084)	\$ 447	\$ (799)	\$ 512,657
3. Actual UAL as of July 1, 2018 [1. + 2e.]	\$ 2,852,778	\$ 1,467,570	\$ 621,681	\$ 777,976	\$ 14,458	\$ 301,969	\$ 87,279	\$ 844	\$ (1,007)	\$ 6,123,548
4. Expected Changes in UAL from July 1, 2018 to July 1, 2019 due to										
a. Interest on Changes in UAL	\$ 17,580	\$ 8,799	\$ 3,379	\$ 11,582	\$ 13	\$ (1,903)	\$ (462)	\$ 34	\$ (61)	\$ 38,962
b. FY 2019 Amortization Contribution	(315,651)	(166,654)	(71,002)	(33,776)	(1,084)	(17,324)	(5,392)	(10)	5	(610,888)
c. Subtotal	\$ (298,070)	\$ (157,855)	\$ (67,623)	\$ (22,194)	\$ (1,071)	\$ (19,227)	\$ (5,854)	\$ 24	\$ (56)	\$ (571,926)
5. Expected UAL as of July 1, 2019 [3. + 4c.]	\$ 2,554,708	\$ 1,309,715	\$ 554,058	\$ 755,782	\$ 13,387	\$ 282,742	\$ 81,425	\$ 868	\$ (1,063)	\$ 5,551,622

\* Expected UAL is based upon the City's funding policy

Note: Numbers may not add due to rounding.

**CITY OF PHILADELPHIA MUNICIPAL RETIREMENT SYSTEM  
JULY 1, 2018 ACTUARIAL VALUATION**

**SECTION V – CONTRIBUTIONS AND MINIMUM MUNICIPAL OBLIGATION**

In the process of evaluating the financial condition of any pension system, the actuary analyzes the assets and liabilities to determine what level (if any) of contributions are needed based on the funding methods either required by law or adopted by the plan sponsor. For an actuarial funding method to be effective, it should result in a pattern of contributions that are both stable and predictable as well as systematically fund the plan obligations.

The actuarial funding method used to determine the normal cost and the unfunded actuarial liability is the Entry Age Normal (EAN) cost method. The normal cost is based on taking the value, as of entry age into the plan, of each member's projected future benefits. This value is then divided by the value, also at entry age, of each member's expected future salary producing a normal cost rate as a percent of salary that should remain relatively constant over a participant's career. The normal cost rate is multiplied by current salary to determine each member's normal cost which is then all summed to get the total normal cost for all members. Finally, the total normal cost is reduced by the member contribution to produce the employer normal cost. The normal cost also includes an explicit administrative expense assumption to account for anticipated administrative expenses. The unfunded actuarial liability is the difference between the EAN actuarial liability and the actuarial value of assets.

Within this section of the report, three contribution amounts are determined based on three different sets of funding policies for determining the way the unfunded actuarial liability is funded. The first policy is defined in accordance with Act 205 and defines the Minimum Municipal Obligation (MMO), which is the City's minimum required contribution under Pennsylvania State law. The second approach is the Revenue Recognition Policy (RRP), which is similar to the MMO calculations except the assets used for determining the contributions exclude the accumulated value of sales tax revenue and tier and additional member contributions received by the System. The third approach is in accordance with the City's Funding Policy implemented in 1984, which predates the Act 205 rules and calls for contributions that are greater than the MMO until the initial unfunded liability determined in 1984 is fully funded. Under all funding methods there are two components: the normal cost and the amortized unfunded actuarial liability. The amortized unfunded actuarial liability is the amount of the unfunded actuarial liability that is paid each year based upon the given or defined amortization periods. The amortization periods are different under the MMO/RRP and the City's Funding Policy. These amortization periods are outlined in more detail in Appendix C, Section B.

As of July 1, 2010, gains and losses are recognized annually to determine the amortization base used to calculate the MMO, as opposed to biennially. This change is implemented in accordance with section 1002 of Act 205 and has been continued since then to provide greater transparency in the determination of the period and amount of such amounts.

In addition, the MMO, excluding the Pension Obligation Bond (POB), is also provided in this section, as required for reporting purposes under Act 205.

**CITY OF PHILADELPHIA MUNICIPAL RETIREMENT SYSTEM  
JULY 1, 2018 ACTUARIAL VALUATION**

**SECTION V – CONTRIBUTIONS AND MINIMUM MUNICIPAL OBLIGATION**

In Table V-1 we provide the employee contribution rates as a percent of pay effective for the plan year starting July 1, 2019. The rates shown include the 1% increase in contributions for certain municipal employees and elected officials as required by legislation in 2015 as well as the additional 1% for new employees in these groups entering Plan 87 Municipal prime. This year we also included a new rate for Plan 16 participants eligible for accelerated vesting. The rates shown for Police Officers and Firefighters in Plan 87 and 87 Prime and Plan 10 include the increases effective July 1, 2017 resulting from the Pension Award.

**Table V-1  
Employee Contribution Rates  
for the Plan Year Beginning July 1, 2019**

	<b>Municipal<sup>1</sup></b>	<b>Elected<sup>2</sup></b>	<b>Police</b>	<b>Fire</b>
Plan 67	7.00%	N/A	6.00%	6.00%
Plan 87	3.49%	10.75%	6.84%	6.84%
Plan 87- 50% of Aggregate NC <sup>3</sup>	4.15%	N/A	N/A	N/A
Plan 87 - Accelerated Vesting <sup>4</sup>	4.25%	12.78%	N/A	N/A
Plan 87 Prime <sup>5</sup>	4.49%	11.75%	7.84%	7.84%
Plan '10	2.33%	N/A	7.34%	7.34%
Plan '10 - Accelerated Vesting	2.75%	N/A	N/A	N/A
Plan '16 <sup>6</sup>	4.04%	N/A	N/A	N/A
Plan '16 - Accelerated Vesting <sup>7</sup>	4.53%	N/A	N/A	N/A

<sup>1</sup> For Municipal Plan 67 members who participate in the Social Security System, employee contributions are 4.75% of compensation up to the social security wage base and 7% above it.

<sup>2</sup> The employee contribution rate is based upon the normal cost of \$532,080 under Plan 87 Elected, normal cost of \$300,735 under Plan 87 Municipal and current annual payroll of \$3,298,255.

<sup>3</sup> This represents 50% of Aggregate Normal Cost for all members in Plan Y and applies to Deputy Sheriffs hired between 1/1/2012 and 6/20/2018.

<sup>4</sup> Member rate for Municipal Plan 87 (Y5) members eligible to vest in 5 years and Elected Officials (L8) eligible to be vested in 8 years instead of 10 years.

<sup>5</sup> Plan 87 Prime refers to new hires who have the option to elect Plan '10 but have elected to stay in Plan '87. New hires after 7/1/2017 in Police and Fire Plan 87 Prime pay 8.50%

<sup>6</sup> Beginning January 1, 2019, all Municipal groups (except elected officials) will participate in Plan '16. Because there are no members in this group, the employee contribution rate is based on recent new hires and is phased in over 10 years beginning in 2018 with the employee contribution rate calculated for all Municipal members from Plan 87 valued under Plan 16.

<sup>7</sup> Member rate for Municipal Plan 16 members eligible to vest in 7 years instead of 10 years.

**CITY OF PHILADELPHIA MUNICIPAL RETIREMENT SYSTEM  
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**SECTION V – CONTRIBUTIONS AND MINIMUM MUNICIPAL OBLIGATION**

Table V-2a and Table V-2b isolate the contribution requirements for the Quasi Agencies that participate in the System broken out for Municipal Plans 1967, 1987, 2010, and 2016 both under the Funding Policy and MMO.

<b>Table V-2a</b>		
<b>Quasi Agency Funding Rate as a</b>		
<b>Percent of Payroll (Based on Funding Policy)</b>		
<b>Valuation Date</b>	<b>July 1, 2018</b>	<b>July 1, 2017</b>
<b>Fiscal Year Ending in Year</b>	<b>2020</b>	<b>2019</b>
<b>67 Municipal</b>		
1. Normal Cost Rate	6.899%	8.386%
2. Amortization Rate under the City's Funding Policy	<u>444.927%</u>	<u>508.863%</u>
3. Total Year-End Rate [1. + 2.]	451.825%	517.249%
4. Quarterly adjustment factor	0.97270	0.97253
5. Total, adjusted for Quarterly Payments [3. x 4.]	439.491%	503.040%
<b>87 Municipal</b>		
1. Normal Cost Rate	4.070%	3.957%
2. Amortization Rate under the City's Funding Policy	<u>10.174%</u>	<u>8.836%</u>
3. Total Year-End Rate [1. + 2.]	14.243%	12.793%
4. Quarterly adjustment factor	0.97270	0.97253
5. Total, adjusted for Quarterly Payments [3. x 4.]	13.854%	12.441%
<b>Plan 10 Municipal</b>		
1. Normal Cost Rate	2.512%	2.385%
2. Amortization Rate under the City's Funding Policy	<u>0.132%</u>	<u>0.070%</u>
3. Total Year-End Rate [1. + 2.]	2.645%	2.455%
4. Quarterly adjustment factor	0.97270	0.97253
5. Total, adjusted for Quarterly Payments [3. x 4.]	2.573%	2.388%
<b>Plan 16 Municipal</b>		
1. Normal Cost Rate	2.831%	3.439%
2. Amortization Rate under the City's Funding Policy	<u>-0.194%</u>	<u>-0.114%</u>
3. Total Year-End Rate [1. + 2.]	2.638%	3.325%
4. Quarterly adjustment factor	0.97270	0.97253
5. Total, adjusted for Quarterly Payments [3. x 4.]	2.566%	3.234%

**CITY OF PHILADELPHIA MUNICIPAL RETIREMENT SYSTEM  
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**SECTION V – CONTRIBUTIONS AND MINIMUM MUNICIPAL OBLIGATION**

**Table V-2b  
Quasi Agency Funding Rate as a  
Percent of Payroll (Based on MMO)**

<b>Valuation Date</b>	<b>July 1, 2018</b>	<b>July 1, 2017</b>
<b>Fiscal Year Ending in Year</b>	<b>2020</b>	<b>2019</b>
<b>67 Municipal</b>		
1. Normal Cost Rate	6.899%	8.386%
2. Amortization Rate under MMO*	<u>358.231%</u>	<u>294.232%</u>
3. Total Year-End Rate [1. + 2.]	365.130%	302.619%
4. Quarterly adjustment factor	0.97270	0.97253
5. Total, adjusted for Quarterly Payments [3. x 4.]	355.162%	294.306%
<b>87 Municipal</b>		
1. Normal Cost Rate	4.070%	3.957%
2. Amortization Rate under MMO*	<u>8.899%</u>	<u>7.206%</u>
3. Total Year-End Rate [1. + 2.]	12.969%	11.163%
4. Quarterly adjustment factor	0.97270	0.97253
5. Total, adjusted for Quarterly Payments [3. x 4.]	12.615%	10.856%
<b>Plan 10 Municipal</b>		
1. Normal Cost Rate	2.512%	2.385%
2. Amortization Rate under MMO*	<u>0.118%</u>	<u>0.068%</u>
3. Total Year-End Rate [1. + 2.]	2.631%	2.453%
4. Quarterly adjustment factor	0.97270	0.97253
5. Total, adjusted for Quarterly Payments [3. x 4.]	2.559%	2.386%
<b>Plan 16 Municipal</b>		
1. Normal Cost Rate	2.831%	3.439%
2. Amortization Rate under MMO*	<u>-0.195%</u>	<u>-0.110%</u>
3. Total Year-End Rate [1. + 2.]	2.636%	3.330%
4. Quarterly adjustment factor	0.97270	0.97253
5. Total, adjusted for Quarterly Payments [3. x 4.]	2.564%	3.238%

\* The amortization amounts were derived based on the proportional share of the Unfunded Actuarial Liability.

**CITY OF PHILADELPHIA MUNICIPAL RETIREMENT SYSTEM  
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**SECTION V – CONTRIBUTIONS AND MINIMUM MUNICIPAL OBLIGATION**

Table V-3a shows the development of the FYE 2020 Minimum Municipal Obligation (MMO) and Table V-3b shows the Revenue Recognition Policy (RRP) for each division. Table V-4 on the following page shows a schedule of amortization payments toward the MMO.

<b>Table V-3a</b>				
<b>Development of the Minimum Municipal Obligation for Fiscal Year End 2020</b>				
<b>(\$ thousands)</b>				
	<b>Non-Uniformed</b>	<b>Police</b>	<b>Fire</b>	<b>Total</b>
Estimated FY 2019-2020 Payroll	\$ 1,171,257	\$ 506,539	\$ 187,182	\$ 1,864,978
Normal Cost %	7.744%	12.718%	13.164%	9.639%
Normal Cost	\$ 89,292	\$ 64,263	\$ 24,592	\$ 178,147
Amortization Payment	355,703	167,395	68,141	591,238
Administrative Expenses	6,750	2,451	854	10,055
Subtotal	\$ 451,745	\$ 234,109	\$ 93,587	\$ 779,440
Expected Employee Contributions*	(54,401)	(35,831)	(13,457)	(103,689)
Minimum Municipal Obligation	\$ 397,344	\$ 198,277	\$ 80,130	\$ 675,751

\* Includes additional expected member contributions from Police and Fire Plans 87 and Tier Contributions from Municipal Plans

<b>Table V-3b</b>				
<b>Development of the Revenue Recognition Policy for Fiscal Year End 2020</b>				
<b>(\$ thousands)</b>				
	<b>Non-Uniformed</b>	<b>Police</b>	<b>Fire</b>	<b>Total</b>
Estimated FY 2019-2020 Payroll	\$ 1,171,257	\$ 506,539	\$ 187,182	\$ 1,864,978
Normal Cost %	7.744%	12.718%	13.164%	9.639%
Normal Cost	\$ 89,292	\$ 64,263	\$ 24,592	\$ 178,147
Amortization Payment	358,907	169,445	68,768	597,120
Administrative Expenses	6,750	2,451	854	10,055
Subtotal	\$ 454,949	\$ 236,159	\$ 94,214	\$ 785,322
Expected Employee Contributions *	(44,048)	(26,634)	(10,051)	(80,734)
Revenue Recognition Policy	\$ 410,900	\$ 209,526	\$ 84,163	\$ 704,589

\* Does not include additional expected member contributions from Police and Fire Plans 87 and Tier Contributions from Municipal Plans

Note: Numbers may not add due to rounding.

**CITY OF PHILADELPHIA MUNICIPAL RETIREMENT SYSTEM  
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**SECTION V – CONTRIBUTIONS AND MINIMUM MUNICIPAL OBLIGATION**

Table V-4 Unfunded Liability Payments toward the MMO for Fiscal Year 2020 (\$ thousands)												
Type of Base	Municipal			Police			Fire			Total		
	7/1/2018 Balance	Years Left	FY 2020 Payment									
<b>Fresh Start Base</b>												
est. July 1, 2009	\$ 2,459,512	21	\$ 221,230	\$ 1,384,421	21	\$ 124,527	\$ 536,489	21	\$ 48,257	\$ 4,380,422	21	\$ 394,014
<b>Gain/Loss Base</b>												
est. July 1, 2010	\$ (46,074)	12	\$ (5,565)	\$ (32,853)	12	\$ (3,968)	\$ (2,459)	12	\$ (297)	\$ (81,386)	12	\$ (9,830)
<b>Assumption Change</b>												
est. July 1, 2010	\$ 51,837	7	\$ 9,127	\$ 20,799	7	\$ 3,662	\$ 18,982	7	\$ 3,342	\$ 91,619	7	\$ 16,131
<b>Gain/Loss</b>												
est. July 1, 2011	\$ (92,148)	13	\$ (10,598)	\$ (18,672)	13	\$ (2,148)	\$ (18,362)	13	\$ (2,112)	\$ (129,182)	13	\$ (14,857)
<b>Assumption Change</b>												
est. July 1, 2011	\$ 15,665	8	\$ 2,495	\$ 9,419	8	\$ 1,500	\$ 3,176	8	\$ 506	\$ 28,261	8	\$ 4,501
<b>Gain/Loss</b>												
est. July 1, 2012	\$ 129,437	14	\$ 14,254	\$ 68,459	14	\$ 7,539	\$ 17,729	14	\$ 1,952	\$ 215,624	14	\$ 23,745
<b>Assumption Change</b>												
est. July 1, 2012	\$ 44,517	9	\$ 6,513	\$ 25,433	9	\$ 3,721	\$ 8,887	9	\$ 1,300	\$ 78,837	9	\$ 11,534
<b>Gain/Loss</b>												
est. July 1, 2013	\$ 116,378	15	\$ 12,329	\$ 33,900	15	\$ 3,591	\$ (4,785)	15	\$ (507)	\$ 145,493	15	\$ 15,414
<b>Assumption Change</b>												
est. July 1, 2013	\$ 62,061	10	\$ 8,441	\$ 37,215	10	\$ 5,062	\$ 12,413	10	\$ 1,688	\$ 111,689	10	\$ 15,191
<b>Gain/Loss</b>												
est. July 1, 2014	\$ 95,336	16	\$ 9,756	\$ 39,045	16	\$ 3,995	\$ 45,316	16	\$ 4,637	\$ 179,696	16	\$ 18,388
<b>Assumption Change</b>												
est. July 1, 2014	\$ 216,754	11	\$ 27,672	\$ (7,592)	11	\$ (969)	\$ 8,717	11	\$ 1,113	\$ 217,880	11	\$ 27,816
<b>Gain/Loss</b>												
est. July 1, 2015	\$ 161,774	17	\$ 16,045	\$ 36,732	17	\$ 3,643	\$ 35,394	17	\$ 3,511	\$ 233,900	17	\$ 23,199
<b>Assumption Change</b>												
est. July 1, 2015	\$ 24,469	12	\$ 2,955	\$ 35,362	12	\$ 4,271	\$ 11,291	12	\$ 1,364	\$ 71,122	12	\$ 8,590
<b>Gain/Loss</b>												
est. July 1, 2016	\$ 112,375	18	\$ 10,836	\$ 74,281	18	\$ 7,163	\$ 20,666	18	\$ 1,993	\$ 207,322	18	\$ 19,992
<b>Assumption Change</b>												
est. July 1, 2016	\$ 26,288	13	\$ 3,023	\$ 15,680	13	\$ 1,803	\$ 5,198	13	\$ 598	\$ 47,166	13	\$ 5,425
<b>Gain/Loss</b>												
est. July 1, 2017	\$ 81,618	19	\$ 7,673	\$ 65,772	19	\$ 6,183	\$ 16,036	19	\$ 1,507	\$ 163,426	19	\$ 15,363
<b>Assumption Change</b>												
est. July 1, 2017	\$ 27,991	14	\$ 3,083	\$ 16,868	14	\$ 1,858	\$ 5,589	14	\$ 616	\$ 50,449	14	\$ 5,556
<b>Gain/Loss</b>												
est. July 1, 2018	\$ 16,204	20	\$ 1,489	\$ 25,589	20	\$ 2,351	\$ 9,102	20	\$ 836	\$ 50,896	20	\$ 4,675
<b>Assumption Change</b>												
est. July 1, 2018	\$ 141,052	15	\$ 14,943	\$ (60,319)	15	\$ (6,390)	\$ (20,419)	15	\$ (2,163)	\$ 60,314	15	\$ 6,390
<b>Total</b>	<b>\$ 3,645,050</b>		<b>\$ 355,703</b>	<b>\$ 1,769,539</b>		<b>\$ 167,395</b>	<b>\$ 708,959</b>		<b>\$ 68,141</b>	<b>\$ 6,123,548</b>		<b>\$ 591,238</b>

Note: Numbers may not add due to rounding.

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Table V-5 (a) – (d) provides more detail by plan on the expected and actual unfunded actuarial liability and the new amortization bases established as of July 1, 2018 for the MMO.

<b>Table V-5a</b>			
<b>Development of the Fiscal Year 2020 Amortization Payment under MMO</b>			
<b>Municipal and Elected</b>			
<b>(\$ thousands)</b>			
	<b>7/1/2018</b>	<b>Remaining</b>	<b>FY 2020</b>
	<b>Outstanding Balance</b>	<b>Years</b>	<b>Payment</b>
1. Expected Unfunded Actuarial Liability (UAL) as of July 1, 2018 Based on July 1, 2017 Valuation	\$ 3,487,793		\$ 339,271
2. Changes in UAL due to			
a. Actuarial Experience	\$ 16,204	20	\$ 1,489
b. Assumption Changes	141,052	15	14,943
c. Active Plan Changes	0	10	0
d. Inactive Plan Changes	<u>0</u>	<u>1</u>	<u>0</u>
e. Subtotal	\$ 157,257		\$ 16,432
3. Total [1c. + 2e.]	\$ 3,645,050		\$ 355,703

Note: Numbers may not add due to rounding.

<b>Table V-5b</b>			
<b>Development of the Fiscal Year 2020 Amortization Payment under MMO</b>			
<b>Police</b>			
<b>(\$ thousands)</b>			
	<b>7/1/2018</b>	<b>Remaining</b>	<b>FY 2020</b>
	<b>Outstanding Balance</b>	<b>Years</b>	<b>Payment</b>
1. Expected Unfunded Actuarial Liability (UAL) as of July 1, 2018 Based on July 1, 2017 Valuation	\$ 1,804,269		\$ 171,434
2. Changes in UAL due to			
a. Actuarial Experience	\$ 25,589	20	\$ 2,351
b. Assumption Changes	(60,319)	15	(6,390)
c. Active Plan Changes	0	10	0
d. Inactive Plan Changes	<u>0</u>	<u>1</u>	<u>0</u>
e. Subtotal	\$ (34,730)		\$ (4,040)
3. Total [1c. + 2e.]	\$ 1,769,539		\$ 167,394

Note: Numbers may not add due to rounding.

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<b>Table V-5c</b>			
<b>Development of the Fiscal Year 2020 Amortization Payment under MMO</b>			
<b>Fire</b>			
<b>(\$ thousands)</b>			
	<b>7/1/2018 Outstanding Balance</b>	<b>Remaining Years</b>	<b>FY 2020 Payment</b>
1. Expected Unfunded Actuarial Liability (UAL) as of July 1, 2018 Based on July 1, 2017 Valuation	\$ 720,277		\$ 69,468
2. Changes in UAL due to			
a. Actuarial Experience	\$ 9,102	20	\$ 836
b. Assumption Changes	(20,419)	15	(2,163)
c. Active Plan Changes	0	10	0
d. Inactive Plan Changes	0	1	0
e. Subtotal	\$ (11,318)		\$ (1,327)
3. Total [1c. + 2e.]	\$ 708,959		\$ 68,141

Note: Numbers may not add due to rounding.

<b>Table V-5d</b>			
<b>Development of the Fiscal Year 2020 Amortization Payment under MMO</b>			
<b>Total</b>			
<b>(\$ thousands)</b>			
	<b>7/1/2018 Outstanding Balance</b>	<b>Remaining Years</b>	<b>FY 2020 Payment</b>
1. Expected Unfunded Actuarial Liability (UAL) as of July 1, 2018 Based on July 1, 2017 Valuation	\$ 6,012,339		\$ 580,173
2. Changes in UAL due to			
a. Actuarial Experience	\$ 50,896	20	\$ 4,675
b. Assumption Changes	60,314	15	6,390
c. Active Plan Changes	0	10	0
d. Inactive Plan Changes	0	1	0
e. Subtotal	\$ 111,210		\$ 11,065
3. Total [1c. + 2e.]	\$ 6,123,549		\$ 591,238

Note: Numbers may not add due to rounding.

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The tables on the following pages support Exhibit I of the Act 205 filings.

- Table V-6 is a summary of assets, liabilities, and amortization contributions under the assumption that the Pension Obligation Bond (POB) was never contributed.
- Table V-7 is a schedule of modified amortization payments under the assumption that the proceeds from the POB were never contributed.
- Table V-8a, V-8b, and V-8c are debt service schedules for the POB, allocated for the Municipal, Police, and Fire divisions.
- Tables V-9a and V-9b are statements of receipts and disbursements for each division excluding and including bond issue assets, respectively, excluding the PAF.

<b>Table V-6</b>				
<b>Summary of Modified Actuarial Data</b>				
(\$ thousands)				
	<b>Municipal</b>	<b>Police</b>	<b>Fire</b>	<b>Total</b>
Actuarial Liability	\$ 6,585,188	\$ 3,651,233	\$ 1,284,561	\$ 11,520,980
Market Value of Assets (less POB)	\$ 2,669,064	\$ 1,782,192	\$ 471,687	\$ 4,922,943
Actuarial Value of Assets (less POB)	\$ 2,566,305	\$ 1,672,081	\$ 464,077	\$ 4,702,463
Unfunded Actuarial Liability (AL - AVA)	\$ 4,018,883	\$ 1,979,152	\$ 820,484	\$ 6,818,519
<b>Amortization Contributions</b>				
Total Amortization Amount	\$ 389,782	\$ 186,959	\$ 78,427	\$ 655,168
Remaining Years	18	19	18	18

Note: Numbers may not add due to rounding.

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Table V-7 Modified Unfunded Liability Payments toward the MMO for Fiscal Year 2020 (\$ thousands)												
Type of Base	Municipal			Police			Fire			Total		
	7/1/2018 Balance	Remaining Years	FY 2020 Payment									
<b>Fresh Start UAL Base est. July 1, 2009</b>	\$ 2,884,156	21	\$ 259,427	\$ 1,562,204	21	\$ 140,519	\$ 661,818	21	\$ 59,530	\$ 5,108,178	21	\$ 459,475
<b>July 1, 2010 Charges</b>												
Experience (Gain)/Loss	\$ (40,807)	12	\$ (4,929)	\$ (28,545)	12	\$ (3,448)	\$ 1,401	12	\$ 169	\$ (67,950)	12	\$ (8,207)
Assumption Change	51,837	7	9,127	20,799	7	3,662	18,982	7	3,342	91,619	7	16,131
<b>July 1, 2011 Charges</b>												
Experience (Gain)/Loss	\$ (72,094)	13	\$ (8,292)	\$ (7,267)	13	\$ (836)	\$ (9,732)	13	\$ (1,119)	\$ (89,094)	13	\$ (10,247)
Assumption Change	\$ 15,665	8	\$ 2,495	\$ 9,419	8	\$ 1,500	\$ 3,176	8	\$ 506	\$ 28,261	8	\$ 4,501
<b>July 1, 2012 Charges</b>												
Experience (Gain)/Loss	\$ 130,036	14	\$ 14,320	\$ 72,187	14	\$ 7,950	\$ 18,512	14	\$ 2,039	\$ 220,734	14	\$ 24,308
Assumption Change	\$ 44,517	9	\$ 6,513	\$ 25,433	9	\$ 3,721	\$ 8,887	9	\$ 1,300	\$ 78,837	9	\$ 11,534
<b>July 1, 2013 Charges</b>												
Experience (Gain)/Loss	\$ 124,792	15	\$ 13,221	\$ 42,276	15	\$ 4,479	\$ (2,887)	15	\$ (306)	\$ 164,181	15	\$ 17,393
Assumption Change	\$ 62,061	10	\$ 8,441	\$ 37,215	10	\$ 5,062	\$ 12,413	10	\$ 1,688	\$ 111,689	10	\$ 15,191
<b>July 1, 2014 Charges</b>												
Experience (Gain)/Loss	\$ 95,831	16	\$ 9,806	\$ 43,673	16	\$ 4,469	\$ 44,829	16	\$ 4,587	\$ 184,334	16	\$ 18,862
Assumption Change	\$ 216,754	11	\$ 27,672	\$ (7,592)	11	\$ (969)	\$ 8,717	11	\$ 1,113	\$ 217,880	11	\$ 27,816
<b>July 1, 2015 Charges</b>												
Experience (Gain)/Loss	\$ 157,707	17	\$ 15,642	\$ 40,394	17	\$ 4,006	\$ 34,340	17	\$ 3,406	\$ 232,441	17	\$ 23,054
Assumption Change	\$ 24,469	12	\$ 2,955	\$ 35,362	12	\$ 4,271	\$ 11,291	12	\$ 1,364	\$ 71,122	12	\$ 8,590
<b>July 1, 2016 Charges</b>												
Experience (Gain)/Loss	\$ 88,560	18	\$ 8,540	\$ 75,056	18	\$ 7,238	\$ 12,475	18	\$ 1,203	\$ 176,090	18	\$ 16,980
Assumption Change	\$ 26,288	13	\$ 3,023	\$ 15,680	13	\$ 1,803	\$ 5,198	13	\$ 598	\$ 47,166	13	\$ 5,425
<b>July 1, 2018 Charges</b>												
Experience (Gain)/Loss	\$ 52,517	19	\$ 4,937	\$ 63,553	19	\$ 5,974	\$ 6,192	19	\$ 582	\$ 122,261	19	\$ 11,493
Assumption Change	\$ 27,991	14	\$ 3,083	\$ 16,868	14	\$ 1,858	\$ 5,589	14	\$ 616	\$ 50,449	14	\$ 5,556
<b>July 1, 2018 Charges</b>												
Experience (Gain)/Loss	\$ (12,452)	20	\$ (1,144)	\$ 22,756	20	\$ 2,090	\$ (297)	20	\$ (27)	\$ 10,006	20	\$ 919
Assumption Change	\$ 141,052	15	\$ 14,943	\$ (60,319)	15	\$ (6,390)	\$ (20,419)	15	\$ (2,163)	\$ 60,314	15	\$ 6,390
<b>Total</b>	\$ 4,018,882		\$ 389,782	\$ 1,979,152		\$ 186,959	\$ 820,484		\$ 78,427	\$ 6,818,518		\$ 655,167

Note: Numbers may not add due to rounding.

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Table V-8a				
TOTAL DEBT SERVICE REQUIREMENTS: MUNICIPAL				
Plan Year	Required Principal Payment	Required Interest Payment	Premium or Discount Amortized	Principal Balance at Valuation Date
1999	\$ 0	\$ 7,041,525.30	\$ 0	\$ 727,185,593.15
2000	9,917,857.50	29,825,175.27	0	717,267,735.65
2001	4,567,730.63	29,324,323.46	0	712,700,005.02
2002	0	29,087,715.02	0	712,700,005.02
2003	6,422,403.75	29,087,715.02	0	706,277,601.27
2004	8,884,981.88	28,728,336.25	0	697,392,619.39
2005	15,161,038.13	28,250,550.75	0	682,231,581.26
2006	18,743,737.50	27,403,048.72	0	663,487,843.76
2007	22,526,257.50	26,345,901.92	0	640,961,586.26
2008	26,486,083.13	25,064,157.87	0	614,475,503.13
2009	30,870,879.38	23,543,856.70	0	583,604,623.75
2010	40,000,711.88	21,756,432.78	0	543,603,911.87
2011	45,151,018.13	19,420,391.21	0	498,452,893.74
2012	22,154,721.72	45,234,066.39	0	476,298,172.02
2013	21,786,233.75	48,416,929.37	0	454,511,938.27
2014	20,545,516.84	50,378,126.28	0	433,966,421.43
2015	20,088,811.07	53,652,021.42	0	413,877,610.36
2016	19,364,886.72	56,464,212.02	0	394,512,723.64
2017	18,085,471.62	57,743,627.12	0	376,427,252.02
2018	16,915,332.51	58,913,766.23	0	359,511,919.51
2019	15,787,131.76	60,041,966.99	0	343,724,787.75
2020	14,758,165.41	61,070,933.33	0	328,966,622.34
2021	13,823,708.03	62,005,390.71	0	315,142,914.31
2022	12,919,375.38	62,909,723.36	0	302,223,538.93
2023	12,071,748.11	63,757,350.63	0	290,151,790.82
2024	11,250,110.80	64,578,987.94	0	278,901,680.02
2025	10,560,195.36	65,268,903.38	0	268,341,484.66
2026	17,271,090.90	58,558,007.84	0	251,070,393.76
2027	60,297,984.38	16,196,263.75	0	190,772,409.38
2028	64,125,534.38	12,367,341.75	0	126,646,875.00
2029	126,646,875.00	4,147,685.16	0	0

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Table V-8b				
TOTAL DEBT SERVICE REQUIREMENTS: POLICE				
Plan Year	Required Principal Payment	Required Interest Payment	Premium or Discount Amortized	Principal Balance at Valuation Date
1999	\$ 0	\$ 3,848,228.76	\$ 0	\$ 397,410,560.15
2000	5,420,158.68	16,299,607.13	0	391,990,401.47
2001	2,496,287.61	16,025,889.30	0	389,494,113.86
2002	0	15,896,581.60	0	389,494,113.86
2003	3,509,875.74	15,896,581.60	0	385,984,238.12
2004	4,855,686.99	15,705,644.36	0	381,128,551.13
2005	8,285,583.09	15,439,067.14	0	372,842,968.04
2006	10,243,546.20	14,975,903.05	0	362,599,421.84
2007	12,310,712.28	14,398,167.04	0	350,288,709.56
2008	14,474,776.77	13,697,687.51	0	335,813,932.79
2009	16,871,089.83	12,866,835.33	0	318,942,842.96
2010	21,860,588.91	11,889,999.22	0	297,082,254.05
2011	24,675,257.01	10,613,340.83	0	272,406,997.04
2012	12,107,666.12	24,720,643.30	0	260,299,330.92
2013	11,906,285.60	26,460,093.82	0	248,393,045.32
2014	11,228,227.61	27,531,897.73	0	237,164,817.71
2015	10,978,635.63	29,321,097.79	0	226,186,182.08
2016	10,583,007.35	30,857,974.00	0	215,603,174.73
2017	9,883,800.61	31,557,180.75	0	205,719,374.12
2018	9,244,313.74	32,196,667.62	0	196,475,060.38
2019	8,627,746.39	32,813,234.97	0	187,847,313.99
2020	8,065,411.14	33,375,570.22	0	179,781,902.85
2021	7,554,725.51	33,886,255.84	0	172,227,177.34
2022	7,060,503.20	34,380,478.16	0	165,166,674.14
2023	6,597,270.66	34,843,710.70	0	158,569,403.48
2024	6,148,241.77	35,292,739.59	0	152,421,161.71
2025	5,771,199.53	35,669,781.82	0	146,649,962.18
2026	9,438,737.48	32,002,243.88	0	137,211,224.70
2027	32,953,149.75	8,851,339.07	0	104,258,074.95
2028	35,044,924.95	6,758,814.06	0	69,213,150.00
2029	69,213,150.00	2,266,730.66	0	0

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<b>Table V-8c</b>					
<b>TOTAL DEBT SERVICE REQUIREMENTS: FIRE</b>					
<b>Plan Year</b>	<b>Required Principal Payment</b>	<b>Required Interest Payment</b>	<b>Premium or Discount Amortized</b>	<b>Principal Balance at Valuation Date</b>	
1999	\$ 0	\$ 1,620,185.70	\$ 0	\$ 167,318,251.01	
2000	2,282,001.44	6,862,479.41	0	165,036,249.57	
2001	1,050,989.88	6,747,238.34	0	163,985,259.69	
2002	0	6,692,797.06	0	163,985,259.69	
2003	1,477,731.92	6,692,797.06	0	162,507,527.77	
2004	2,044,346.92	6,612,408.45	0	160,463,180.85	
2005	3,488,405.72	6,500,173.80	0	156,974,775.13	
2006	4,312,749.60	6,305,171.92	0	152,662,025.53	
2007	5,183,070.24	6,061,932.84	0	147,478,955.29	
2008	6,094,187.16	5,767,016.15	0	141,384,768.13	
2009	7,103,085.64	5,417,209.80	0	134,281,682.49	
2010	9,203,770.28	5,005,941.15	0	125,077,912.21	
2011	10,388,805.08	4,468,440.96	0	114,689,107.13	
2012	5,097,583.51	10,407,913.67	0	109,591,523.62	
2013	5,012,798.05	11,140,259.13	0	104,578,725.57	
2014	4,727,321.30	11,591,511.24	0	99,851,404.27	
2015	4,622,237.80	12,344,802.31	0	95,229,166.47	
2016	4,455,669.93	12,991,859.70	0	90,773,496.54	
2017	4,161,289.10	13,286,240.52	0	86,612,207.44	
2018	3,892,051.60	13,555,478.02	0	82,720,155.84	
2019	3,632,463.70	13,815,065.92	0	79,087,692.14	
2020	3,395,708.67	14,051,820.95	0	75,691,983.47	
2021	3,180,699.22	14,266,830.40	0	72,511,284.25	
2022	2,972,621.18	14,474,908.45	0	69,538,663.07	
2023	2,777,590.48	14,669,939.14	0	66,761,072.59	
2024	2,588,539.82	14,858,989.80	0	64,172,532.77	
2025	2,429,797.06	15,017,732.56	0	61,742,735.71	
2026	3,973,908.11	13,473,621.52	0	57,768,827.60	
2027	13,873,973.00	3,726,600.95	0	43,894,854.60	
2028	14,754,654.60	2,845,603.67	0	29,140,200.00	
2029	29,140,200.00	954,341.55	0	0	

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Table V- 9a provides the receipts and disbursements of assets *excluding* the Bond issue assets and excluding the PAF.

<b>Table V-9a</b>				
<b>Receipts and Disbursements Excluding Bond Issue Assets</b>				
	<b>Municipal</b>	<b>Police</b>	<b>Fire</b>	<b>Total</b>
Assets as of July 1, 2017	\$ 2,401,441,680	\$ 1,607,509,041	\$ 410,938,367	\$ 4,419,889,088
<b>Receipts</b>				
Employer Contributions	\$ 456,372,098	\$ 225,622,309	\$ 100,391,343	\$ 782,385,750
Employee Contributions	42,297,743	31,152,452	9,838,440	83,288,635
State Aid	40,882,658	22,561,596	9,003,408	72,447,662
Supplemental State Assistance	0	0	0	0
Investment Income (includes investment expenses)	218,676,927	146,565,892	38,044,487	403,287,306
Other Receipts	<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>
<b>Total Receipts</b>	<b>\$ 758,229,426</b>	<b>\$ 425,902,248</b>	<b>\$ 157,277,678</b>	<b>\$ 1,341,409,352</b>
<b>Disbursements</b>				
Benefit Payments	\$ 478,330,856	\$ 246,258,126	\$ 95,143,542	\$ 819,732,524
Refund of Contributions	5,480,790	2,498,375	519,749	8,498,914
Administrative Expenses	6,795,071	2,462,484	865,449	10,123,004
PAF Transfer at Year End	0	0	0	0
Other Disbursements	<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>
<b>Total Disbursements</b>	<b>\$ 490,606,717</b>	<b>\$ 251,218,985</b>	<b>\$ 96,528,740</b>	<b>\$ 838,354,442</b>
Assets as of July 1, 2018	\$ 2,669,064,389	\$ 1,782,192,304	\$ 471,687,306	\$ 4,922,943,998

Note: Numbers may not add due to rounding.

**CITY OF PHILADELPHIA MUNICIPAL RETIREMENT SYSTEM  
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**SECTION V – CONTRIBUTIONS AND MINIMUM MUNICIPAL OBLIGATION**

Table IV- 9b provides the market value of assets *including* the Bond issue assets and excluding the PAF.

<b>Table V-9b</b>				
<b>Receipts and Disbursements Including Bond Issue Assets</b>				
	<b>Municipal</b>	<b>Police</b>	<b>Fire</b>	<b>Total</b>
Assets as of July 1, 2017	\$ 2,655,340,794	\$ 1,710,574,205	\$ 507,062,329	\$ 4,872,977,327
<b>Receipts</b>				
Employer Contributions	\$ 411,687,777	\$ 212,892,299	\$ 84,956,588	\$ 709,536,664
Employee Contributions	42,297,743	31,152,452	9,838,440	83,288,635
State Aid	40,882,658	22,561,596	9,003,408	72,447,662
Supplemental State Assistance	0	0	0	0
Investment Income (includes investment expenses)	238,974,846	155,048,332	46,206,257	440,229,435
Other Receipts	0	0	0	0
<b>Total Receipts</b>	<b>\$ 733,843,024</b>	<b>\$ 421,654,679</b>	<b>\$ 150,004,693</b>	<b>\$ 1,305,502,396</b>
<b>Disbursements</b>				
Benefit Payments	\$ 478,330,856	\$ 246,258,126	\$ 95,143,542	\$ 819,732,524
Refund of Contributions	5,480,790	2,498,375	519,749	8,498,914
Administrative Expenses	6,795,071	2,462,484	865,449	10,123,004
PAF Transfer at Year End	0	0	0	0
Other Disbursements	0	0	0	0
<b>Total Disbursements</b>	<b>\$ 490,606,717</b>	<b>\$ 251,218,985</b>	<b>\$ 96,528,740</b>	<b>\$ 838,354,442</b>
Assets as of July 1, 2018	\$ 2,898,577,101	\$ 1,881,009,898	\$ 560,538,282	\$ 5,340,125,281

Note: Numbers may not add due to rounding.

**CITY OF PHILADELPHIA MUNICIPAL RETIREMENT SYSTEM  
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**SECTION V – CONTRIBUTIONS AND MINIMUM MUNICIPAL OBLIGATION**

Table V – 10 and Table V – 11 provide information on the City’s Funding Policy for FYE 2018 and FYE 2019. The differences between the MMO and the City’s Funding Policy are:

- The City’s Funding Policy amortizes the initial July 1, 1985 unfunded actuarial liability over 34 years. Chapter 10 under Act 44 allowed for the amortization of the entire unfunded actuarial liability as of July 1, 2009 to be “fresh started” over a 30-year period for MMO purposes.
- The normal cost portion of the City’s Funding Policy payment is based on actual fiscal year payroll, whereas the MMO is based on the prior year’s estimated payroll for that year.
- **Interest does not accumulate on the MMO, as long as the payment is made by the end of the fiscal year.** This has the impact of creating systematic losses each year which get offset by assumed interest on contributions received before year-end.
- Both the City’s Funding Policy and the MMO utilize valuation results developed in the previous year (e.g., the July 1, 2018 valuation report will determine FYE 2020 contribution amounts). However, no interest is added to the MMO for this delay.
- The MMO reflects amortization of prior years’ City contributions above past MMOs as actuarial gains.

Starting with FYE 2007-2008, the MMO recognized actuarial gains and losses every other year, in order to coincide with the filing of the Act 205 forms. Beginning for FYE 2012, gains and losses are recognized annually. The City’s Funding Policy recognizes actuarial gains and losses on an annual basis.

Table V – 10 develops the amortized amounts for the current year under the City’s Funding Policy. For additional details on the amortized amounts by plan, refer to Appendix B.

Table V – 11 provides the estimated FYE 2020 and updated FYE 2019 contribution amount under the City’s Funding Policy. The estimated FYE 2020 contribution will be updated in next year’s actuarial valuation report based upon the July 1, 2019 payroll.

**CITY OF PHILADELPHIA MUNICIPAL RETIREMENT SYSTEM  
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**SECTION V – CONTRIBUTIONS AND MINIMUM MUNICIPAL OBLIGATION**

Table V-10 Development of the Fiscal Year 2020 Amortization Payment under the City's Funding Policy					
Total (\$ thousands)					
	7/1/2018 Outstanding Balance	7/1/2019 Expected Balance	Remaining Years	FY 2020 Payment Beginning-of-Year	FY 2020 Payment End-of-Year
1. Expected Unfunded Actuarial Liability (UAL) as of July 1, 2018 Based on July 1, 2017 Valuation Remaining	\$ 5,610,891	\$ 5,000,003		\$ 668,724	\$ 719,547
2. Changes in UAL due to					
a. Actuarial Experience	\$ 452,343	\$ 486,721	20	\$ 44,709	\$ 48,107
b. Assumption Changes	60,314	64,898	15	6,875	7,398
c. Active Plan Changes	0	0	10	0	0
d. Inactive Plan Changes	0	0	1	0	0
e. Subtotal	\$ 512,657	\$ 551,619		\$ 51,585	\$ 55,505
3. Total [1c. + 2e.]	\$ 6,123,548	\$ 5,551,622		\$ 720,309	\$ 775,053

Table V-11 City's Funding Policy Contributions*				
Fiscal Year	2020	% of Pay	2019	% of Pay
Estimated FY Payroll	\$ 1,864,978		\$ 1,805,400	**
Normal Cost (with Expenses)	\$ 188,203	10.09%	\$ 169,190	9.37%
Employee Contributions	(103,689)	5.56%	(82,189)	4.55%
City Normal Cost	\$ 84,513	4.53%	\$ 87,001	4.82%
Amortization Payment	720,309	38.62%	965,480	53.48%
City's Funding Policy	\$ 804,822	43.15%	\$ 1,052,481	58.30%

\* Assuming beginning-of-year payment.

\*\* FY 2018 Payroll for the City's Funding Policy is the final payroll for the prior year. All other payroll is estimated based upon the prior year's data used for the actuarial valuation.

**CITY OF PHILADELPHIA MUNICIPAL RETIREMENT SYSTEM  
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**APPENDIX A – MEMBERSHIP INFORMATION**

The data for this valuation was provided by the Board of Pensions as of July 1, 2018. Cheiron did not audit any of the data. However, we did perform an informal examination of the obvious characteristics of the data for reasonableness and consistency in accordance with Actuarial Standard of Practice No. 23. The following is a list of data charts contained in this section:

- A-1: Active Member Data by Plan
- A-2: Non-Active Member Data, Counts, by Plan
- A-3: Non-Active Member Data, Total Annual Benefits, by Plan
- A-4: Non-Active Member Data, Average Annual Benefits, by Plan
- A-5 through A-24: Age/Service Distribution for Active Participants, Counts and Average Salary for all Plans
- A-25: Reconciliation of Plan Membership
- A-26 through A-30: Age and Benefit Distributions for Non-Active Member Data

**CITY OF PHILADELPHIA MUNICIPAL RETIREMENT SYSTEM  
JULY 1, 2018 ACTUARIAL VALUATION**

**APPENDIX A – MEMBERSHIP INFORMATION**

<b>Table A-1</b>							
<b>Active Member Data</b>							
	<b>July 1, 2018</b>	<b>July 1, 2017</b>	<b>% Change</b>		<b>July 1, 2018</b>	<b>July 1, 2017</b>	<b>% Change</b>
<b><u>1967 Municipal</u></b>				<b><u>1987 Elected</u></b>			
Count	1,214	1,497	-18.9%	Count	24	25	-4.0%
Average Age	55.9	55.4	0.9%	Average Age	57.8	56.9	1.6%
Average Service	30.6	29.9	2.4%	Average Service	21.8	21.4	1.8%
Average Salary	\$ 68,878	\$ 67,714	1.7%	Average Salary	\$ 137,427	\$ 136,732	0.5%
Total Annual Salary	\$ 83,618,195	\$ 101,368,392	-17.5%	Total Annual Salary	\$ 3,298,255	\$ 3,418,294	-3.5%
<b><u>1967 Police</u></b>				<b><u>1987 Police</u></b>			
Count	243	294	-17.3%	Count	5,887	5,698	3.3%
Average Age	57.3	56.6	1.1%	Average Age	41.5	41.6	-0.3%
Average Service	32.6	31.7	2.9%	Average Service	15.2	15.4	-1.0%
Average Salary	\$ 95,200	\$ 92,470	3.0%	Average Salary	\$ 79,365	\$ 77,540	2.4%
Total Annual Salary	\$ 23,133,686	\$ 27,186,150	-14.9%	Total Annual Salary	\$ 467,223,367	\$ 441,825,528	5.7%
<b><u>1967 Fire</u></b>				<b><u>1987 Fire</u></b>			
Count	77	93	-17.2%	Count	2,216	2,180	1.7%
Average Age	58.3	57.6	1.1%	Average Age	41.1	40.5	1.3%
Average Service	32.9	32.0	2.7%	Average Service	12.5	12.0	3.9%
Average Salary	\$ 94,651	\$ 91,501	3.4%	Average Salary	\$ 78,481	\$ 75,006	4.6%
Total Annual Salary	\$ 7,288,130	\$ 8,509,590	-14.4%	Total Annual Salary	\$ 173,914,584	\$ 163,513,307	6.4%
<b><u>1987 Municipal</u></b>				<b><u>2010 Municipal</u></b>			
Count	16,154	16,913	-4.5%	Count	1,457	1,312	11.1%
Average Age	45.3	44.8	1.0%	Average Age	37.0	36.2	2.3%
Average Service	11.8	11.2	5.5%	Average Service	2.3	1.7	35.3%
Average Salary	\$ 56,824	\$ 54,565	4.1%	Average Salary	\$ 51,346	\$ 44,291	15.9%
Total Annual Salary	\$ 917,940,870	\$ 922,850,459	-0.5%	Total Annual Salary	\$ 74,811,405	\$ 58,110,267	28.7%

**CITY OF PHILADELPHIA MUNICIPAL RETIREMENT SYSTEM  
JULY 1, 2018 ACTUARIAL VALUATION**

**APPENDIX A – MEMBERSHIP INFORMATION**

<b>Table A-1</b>								
<b>Active Member Data (continued)</b>								
	<b>July 1, 2018</b>	<b>July 1, 2017</b>	<b>% Change</b>		<b>July 1, 2018</b>	<b>July 1, 2017</b>	<b>% Change</b>	
<b><u>2016 Municipal</u></b>				<b><u>Total City</u></b>				
Count	1,573	603	160.9%	Count	28,845	28,615	0.8%	
Average Age	38.1	38.1	0.0%	Average Age	44.0	44.1	-0.2%	
Average Service	0.9	0.5	72.5%	Average Service	12.5	12.7	-1.4%	
Average Salary	\$ 34,438	\$ 29,762	15.7%	Average Salary	\$ 62,590	\$ 60,973	2.7%	
Total Annual Salary	\$ 54,171,604	\$ 17,946,301	201.9%	Total Annual Salary	\$ 1,805,400,096	\$ 1,744,728,288	3.5%	

**CITY OF PHILADELPHIA MUNICIPAL RETIREMENT SYSTEM  
JULY 1, 2018 ACTUARIAL VALUATION**

**APPENDIX A – MEMBERSHIP INFORMATION**

<b>Table A-2 Non-Active Member Data Count</b>							
	<b>July 1, 2018</b>	<b>July 1, 2017</b>	<b>% Change</b>		<b>July 1, 2018</b>	<b>July 1, 2017</b>	<b>% Change</b>
<b><u>Total City</u></b>				<b><u>1987 Municipal Plan</u></b>			
Retired	22,275	22,288	-0.1%	Retired	2,585	2,293	12.7%
Disabled	3,890	3,942	-1.3%	Disabled	528	488	8.2%
Beneficiary	<u>8,547</u>	<u>8,552</u>	-0.1%	Beneficiary	<u>458</u>	<u>419</u>	9.3%
In Pay Status Total	34,712	34,782	-0.2%	In Pay Status Total	3,571	3,200	11.6%
DROP	1,944	1,767	10.0%	DROP	669	532	25.8%
Deferred Vested	1,074	1,157	-7.2%	Deferred Vested	752	781	-3.7%
<b><u>1967 Municipal Plan</u></b>				<b><u>1987 Elected Plan</u></b>			
Retired	12,134	12,367	-1.9%	Retired	19	19	0.0%
Disabled	1,345	1,401	-4.0%	Disabled	0	0	0.0%
Beneficiary	<u>4,788</u>	<u>4,837</u>	-1.0%	Beneficiary	<u>4</u>	<u>4</u>	0.0%
In Pay Status Total	18,267	18,605	-1.8%	In Pay Status Total	23	23	0.0%
DROP	758	761	-0.4%	DROP	1	1	0.0%
Deferred Vested	227	265	-14.3%	Deferred Vested	0	0	0.0%
<b><u>1967 Police Plan</u></b>				<b><u>1987 Police Plan</u></b>			
Retired	5,034	5,150	-2.3%	Retired	473	398	18.8%
Disabled	1,201	1,258	-4.5%	Disabled	461	431	7.0%
Beneficiary	<u>2,291</u>	<u>2,290</u>	0.0%	Beneficiary	<u>164</u>	<u>152</u>	7.9%
In Pay Status Total	8,526	8,698	-2.0%	In Pay Status Total	1,098	981	11.9%
DROP	172	185	-7.0%	DROP	219	180	21.7%
Deferred Vested	1	1	0.0%	Deferred Vested	82	96	-14.6%
<b><u>1967 Fire Plan</u></b>				<b><u>1987 Fire Plan</u></b>			
Retired	1,870	1,912	-2.2%	Retired	160	149	7.4%
Disabled	275	288	-4.5%	Disabled	80	76	5.3%
Beneficiary	<u>774</u>	<u>789</u>	-1.9%	Beneficiary	<u>68</u>	<u>61</u>	11.5%
In Pay Status Total	2,919	2,989	-2.3%	In Pay Status Total	308	286	7.7%
DROP	64	60	6.7%	DROP	61	48	27.1%
Deferred Vested	0	0	0.0%	Deferred Vested	12	14	-14.3%

**CITY OF PHILADELPHIA MUNICIPAL RETIREMENT SYSTEM  
JULY 1, 2018 ACTUARIAL VALUATION**

**APPENDIX A – MEMBERSHIP INFORMATION**

<b>Table A-3 Non-Active Member Data Total Annual Benefit</b>							
	<b>July 1, 2018</b>	<b>July 1, 2017</b>	<b>% Change</b>		<b>July 1, 2018</b>	<b>July 1, 2017</b>	<b>% Change</b>
<b><u>Total City</u></b>				<b><u>1987 Municipal Plan</u></b>			
Retired	\$ 592,834,017	\$ 583,810,766	1.5%	Retired	\$ 36,207,868	\$ 30,931,382	17.1%
Disabled	86,537,158	85,745,773	0.9%	Disabled	10,094,621	9,183,040	9.9%
Beneficiary	82,575,399	80,647,990	2.4%	Beneficiary	3,708,401	3,299,584	12.4%
In Pay Status Total	\$ 761,946,574	\$ 750,204,529	1.6%	In Pay Status Total	\$ 50,010,890	\$ 43,414,006	15.2%
DROP (pension)	\$ 73,818,616	\$ 65,134,550	13.3%	DROP (pension)	\$ 12,531,856	\$ 9,304,348	34.7%
DROP (account balance)	135,355,386	121,206,906	11.7%	DROP (account balance)	19,351,949	14,749,860	31.2%
Deferred Vested	\$ 15,009,883	\$ 16,192,404	-7.3%	Deferred Vested	\$ 9,979,581	\$ 10,251,830	-2.7%
<b><u>1967 Municipal Plan</u></b>				<b><u>1987 Elected Plan</u></b>			
Retired	\$ 320,623,599	\$ 318,569,625	0.6%	Retired	\$ 1,465,458	\$ 1,438,184	1.9%
Disabled	25,968,955	26,760,190	-3.0%	Disabled	0	0	0.0%
Beneficiary	42,749,179	42,053,622	1.7%	Beneficiary	118,681	118,681	0.0%
In Pay Status Total	\$ 389,341,733	\$ 387,383,437	0.5%	In Pay Status Total	\$ 1,584,139	\$ 1,556,865	1.8%
DROP (pension)	\$ 34,775,116	\$ 32,883,171	5.8%	DROP (pension)	\$ 123,864	\$ 123,864	0.0%
DROP (account balance)	66,982,573	61,113,537	9.6%	DROP (account balance)	229,440	104,203	120.2%
Deferred Vested	\$ 3,514,551	\$ 4,130,746	-14.9%	Deferred Vested	\$ 0	\$ 0	0.0%
<b><u>1967 Police Plan</u></b>				<b><u>1987 Police Plan</u></b>			
Retired	\$ 150,900,151	\$ 151,005,013	-0.1%	Retired	\$ 12,493,408	\$ 10,010,578	24.8%
Disabled	23,323,793	24,192,415	-3.6%	Disabled	18,419,429	16,889,302	9.1%
Beneficiary	23,202,009	22,813,021	1.7%	Beneficiary	2,305,333	2,052,179	12.3%
In Pay Status Total	\$ 197,425,953	\$ 198,010,449	-0.3%	In Pay Status Total	\$ 33,218,170	\$ 28,952,059	14.7%
DROP (pension)	\$ 11,221,305	\$ 11,024,522	1.8%	DROP (pension)	\$ 8,608,618	\$ 6,530,256	31.8%
DROP (account balance)	21,423,807	23,371,785	-8.3%	DROP (account balance)	14,003,888	11,502,400	21.7%
Deferred Vested	\$ 13,436	\$ 13,436	0.0%	Deferred Vested	\$ 1,311,234	\$ 1,559,797	-15.9%
<b><u>1967 Fire Plan</u></b>				<b><u>1987 Fire Plan</u></b>			
Retired	\$ 67,256,132	\$ 68,348,211	-1.6%	Retired	\$ 3,887,401	\$ 3,507,773	10.8%
Disabled	5,534,778	5,825,027	-5.0%	Disabled	3,195,582	2,895,799	10.4%
Beneficiary	9,574,914	9,535,456	0.4%	Beneficiary	916,882	775,447	18.2%
In Pay Status Total	\$ 82,365,824	\$ 83,708,694	-1.6%	In Pay Status Total	\$ 7,999,865	\$ 7,179,019	11.4%
DROP (pension)	\$ 4,264,257	\$ 3,692,244	15.5%	DROP (pension)	\$ 2,293,600	\$ 1,576,145	45.5%
DROP (account balance)	9,370,441	7,737,467	21.1%	DROP (account balance)	3,993,287	2,627,653	52.0%
Deferred Vested	\$ 0	\$ 0	0.0%	Deferred Vested	\$ 191,081	\$ 236,595	-19.2%

**CITY OF PHILADELPHIA MUNICIPAL RETIREMENT SYSTEM  
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**APPENDIX A – MEMBERSHIP INFORMATION**

<b>Table A-4 Non-Active Member Data Average Annual Benefit</b>								
	July 1, 2018	July 1, 2017	% Change		July 1, 2018	July 1, 2017	% Change	
<b><u>Total City</u></b>				<b><u>1987 Municipal Plan</u></b>				
Retired	\$ 26,614	\$ 26,194	1.6%	Retired	\$ 14,007	\$ 13,489	3.8%	
Disabled	22,246	21,752	2.3%	Disabled	19,119	18,818	1.6%	
Beneficiary	9,661	9,430	2.4%	Beneficiary	8,097	7,875	2.8%	
In Pay Status Total	\$ 21,951	\$ 21,569	1.8%	In Pay Status Total	\$ 14,005	\$ 13,567	3.2%	
DROP (pension)	\$ 37,973	\$ 36,862	3.0%	DROP (pension)	\$ 18,732	\$ 17,489	7.1%	
DROP (account balance)	69,627	68,595	1.5%	DROP (account balance)	28,927	27,725	4.3%	
Deferred Vested	\$ 13,976	\$ 13,995	-0.1%	Deferred Vested	\$ 13,271	\$ 13,127	1.1%	
<b><u>1967 Municipal Plan</u></b>				<b><u>1987 Elected Plan</u></b>				
Retired	\$ 26,424	\$ 25,760	2.6%	Retired	\$ 77,129	\$ 75,694	1.9%	
Disabled	19,308	19,101	1.1%	Disabled	0	0	0.0%	
Beneficiary	8,928	8,694	2.7%	Beneficiary	29,670	29,670	0.0%	
In Pay Status Total	\$ 21,314	\$ 20,821	2.4%	In Pay Status Total	\$ 68,876	\$ 67,690	1.8%	
DROP (pension)	\$ 45,877	\$ 43,210	6.2%	DROP (pension)	\$ 123,864	\$ 123,864	0.0%	
DROP (account balance)	88,368	80,307	10.0%	DROP (account balance)	229,440	104,203	120.2%	
Deferred Vested	\$ 15,483	\$ 15,588	-0.7%	Deferred Vested	\$ 0	\$ 0	0.0%	
<b><u>1967 Police Plan</u></b>				<b><u>1987 Police Plan</u></b>				
Retired	\$ 29,976	\$ 29,321	2.2%	Retired	\$ 26,413	\$ 25,152	5.0%	
Disabled	19,420	19,231	1.0%	Disabled	39,955	39,186	2.0%	
Beneficiary	10,127	9,962	1.7%	Beneficiary	14,057	13,501	4.1%	
In Pay Status Total	\$ 23,156	\$ 22,765	1.7%	In Pay Status Total	\$ 30,253	\$ 29,513	2.5%	
DROP (pension)	\$ 65,240	\$ 59,592	9.5%	DROP (pension)	\$ 39,309	\$ 36,279	8.4%	
DROP (account balance)	124,557	126,334	-1.4%	DROP (account balance)	63,945	63,902	0.1%	
Deferred Vested	\$ 13,436	\$ 13,436	0.0%	Deferred Vested	\$ 15,991	\$ 16,248	-1.6%	
<b><u>1967 Fire Plan</u></b>				<b><u>1987 Fire Plan</u></b>				
Retired	\$ 35,966	\$ 35,747	0.6%	Retired	\$ 24,296	\$ 23,542	3.2%	
Disabled	20,126	20,226	-0.5%	Disabled	39,945	38,103	4.8%	
Beneficiary	12,371	12,085	2.4%	Beneficiary	13,484	12,712	6.1%	
In Pay Status Total	\$ 28,217	\$ 28,006	0.8%	In Pay Status Total	\$ 25,974	\$ 25,101	3.5%	
DROP (pension)	\$ 66,629	\$ 61,537	8.3%	DROP (pension)	\$ 37,600	\$ 32,836	14.5%	
DROP (account balance)	146,413	128,958	13.5%	DROP (account balance)	65,464	54,743	19.6%	
Deferred Vested	\$ 0	\$ 0	0.0%	Deferred Vested	\$ 15,923	\$ 16,900	-5.8%	

**CITY OF PHILADELPHIA MUNICIPAL RETIREMENT SYSTEM  
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**APPENDIX A – MEMBERSHIP INFORMATION**

**Table A-5  
Distribution of Active Participants (Excludes DROP Participants) as of July 1, 2018 -- Total City**

*COUNTS BY AGE/SERVICE*

Age	Service									Total
	Under 1	1 to 4	5 to 9	10 to 14	15 to 19	20 to 24	25 to 29	30 & Up		
Under 25	266	413	18	1	0	0	0	0	0	698
25 to 29	576	1,783	429	87	1	0	0	0	0	2,876
30 to 34	384	1,422	1,113	749	50	0	0	0	0	3,718
35 to 39	233	841	710	1,283	542	38	0	0	0	3,647
40 to 44	141	566	473	887	980	484	26	0	0	3,557
45 to 49	124	492	385	697	923	1,246	351	22	0	4,240
50 to 54	109	392	295	582	641	1,062	911	249	0	4,241
55 to 59	89	290	255	498	549	671	557	525	0	3,434
60 to 64	55	229	205	303	243	265	160	235	0	1,695
65 & up	28	111	127	171	107	76	35	84	0	739
<b>Total</b>	<b>2,005</b>	<b>6,539</b>	<b>4,010</b>	<b>5,258</b>	<b>4,036</b>	<b>3,842</b>	<b>2,040</b>	<b>1,115</b>	<b>0</b>	<b>28,845</b>

**Table A-6  
Distribution of Active Participants (Excludes DROP Participants) as of July 1, 2018 -- Total City**

*AVERAGE SALARY BY AGE/SERVICE*

Age	Service									Total
	Under 1	1 to 4	5 to 9	10 to 14	15 to 19	20 to 24	25 to 29	30 & Up		
Under 25	\$ 36,160	\$ 37,838	\$ 38,970	\$ 31,138	\$ 0	\$ 0	\$ 0	\$ 0	\$ 0	\$ 37,218
25 to 29	43,317	53,206	56,858	54,083	65,860	0	0	0	0	51,801
30 to 34	43,938	55,270	65,570	67,097	55,916	0	0	0	0	59,574
35 to 39	44,787	54,236	65,448	69,465	70,453	60,545	0	0	0	63,648
40 to 44	42,376	54,241	62,735	69,818	74,898	76,141	63,871	0	0	67,527
45 to 49	37,312	50,407	60,725	65,815	70,691	78,351	79,731	66,696	0	68,633
50 to 54	40,314	50,237	57,157	60,402	65,086	72,970	79,611	72,274	0	67,399
55 to 59	42,366	49,806	54,698	53,757	58,062	68,098	75,079	79,154	0	64,030
60 to 64	36,118	49,755	51,384	53,443	59,138	61,865	73,063	76,650	0	59,336
65 & up	58,505	53,207	48,212	46,150	52,195	47,796	66,113	74,302	0	53,222
<b>Total</b>	<b>\$ 42,029</b>	<b>\$ 52,246</b>	<b>\$ 61,112</b>	<b>\$ 64,269</b>	<b>\$ 67,702</b>	<b>\$ 72,877</b>	<b>\$ 77,448</b>	<b>\$ 76,479</b>	<b>\$ 0</b>	<b>\$ 62,590</b>

**CITY OF PHILADELPHIA MUNICIPAL RETIREMENT SYSTEM  
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**APPENDIX A – MEMBERSHIP INFORMATION**

**Table A-7  
Distribution of Active Participants (Excludes DROP Participants) as of July 1, 2018 -- Municipal (Plan 67)**

*COUNTS BY AGE/SERVICE*

Age	Service									Total
	Under 1	1 to 4	5 to 9	10 to 14	15 to 19	20 to 24	25 to 29	30 & Up		
Under 25	0	0	0	0	0	0	0	0	0	0
25 to 29	0	0	0	0	0	0	0	0	0	0
30 to 34	0	0	1	0	0	0	0	0	0	1
35 to 39	0	0	0	0	0	0	0	0	0	0
40 to 44	0	1	1	0	0	0	1	0	0	3
45 to 49	0	0	0	0	0	5	56	7	0	68
50 to 54	0	0	0	0	3	9	260	166	0	438
55 to 59	0	1	2	0	1	4	191	280	0	479
60 to 64	0	0	0	0	2	1	48	112	0	163
65 & up	0	0	0	0	0	0	17	45	0	62
<b>Total</b>	<b>0</b>	<b>2</b>	<b>4</b>	<b>0</b>	<b>6</b>	<b>19</b>	<b>573</b>	<b>610</b>	<b>0</b>	<b>1,214</b>

**Table A-8  
Distribution of Active Participants (Excludes DROP Participants) as of July 1, 2018 -- Municipal (Plan 67)**

*AVERAGE SALARY BY AGE/SERVICE*

Age	Service									Total
	Under 1	1 to 4	5 to 9	10 to 14	15 to 19	20 to 24	25 to 29	30 & Up		
Under 25	\$ 0	\$ 0	\$ 0	\$ 0	\$ 0	\$ 0	\$ 0	\$ 0	\$ 0	\$ 0
25 to 29	0	0	0	0	0	0	0	0	0	0
30 to 34	0	0	73,942	0	0	0	0	0	0	73,942
35 to 39	0	0	0	0	0	0	0	0	0	0
40 to 44	0	48,184	61,775	0	0	0	51,991	0	0	53,983
45 to 49	0	0	0	0	0	56,579	72,049	62,542	0	69,933
50 to 54	0	0	0	0	40,951	61,550	68,023	68,513	0	67,890
55 to 59	0	55,867	77,567	0	38,589	49,832	66,229	74,413	0	70,844
60 to 64	0	0	0	0	90,057	58,036	65,360	68,443	0	67,736
65 & up	0	0	0	0	0	0	52,351	67,237	0	63,155
<b>Total</b>	<b>\$ 0</b>	<b>\$ 52,026</b>	<b>\$ 72,713</b>	<b>\$ -</b>	<b>\$ 56,926</b>	<b>\$ 57,590</b>	<b>\$ 67,102</b>	<b>\$ 71,046</b>	<b>\$ 0</b>	<b>\$ 68,878</b>

**CITY OF PHILADELPHIA MUNICIPAL RETIREMENT SYSTEM  
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**APPENDIX A – MEMBERSHIP INFORMATION**

**Table A-9  
Distribution of Active Participants (Excludes DROP Participants) as of July 1, 2018 -- Police (Plan 67)**

*COUNTS BY AGE/SERVICE*

Age	Service									Total
	Under 1	1 to 4	5 to 9	10 to 14	15 to 19	20 to 24	25 to 29	30 & Up		
Under 25	0	0	0	0	0	0	0	0	0	0
25 to 29	0	0	0	0	0	0	0	0	0	0
30 to 34	0	0	0	0	0	0	0	0	0	0
35 to 39	0	0	0	0	0	0	0	0	0	0
40 to 44	0	0	0	0	0	0	0	0	0	0
45 to 49	0	0	0	0	0	1	4	1		6
50 to 54	0	0	0	0	1	1	23	24		49
55 to 59	0	0	0	0	0	0	9	114		123
60 to 64	0	0	0	0	0	0	0	58		58
65 & up	0	0	0	0	0	0	0	7		7
<b>Total</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>1</b>	<b>2</b>	<b>36</b>	<b>204</b>		<b>243</b>

**Table A-10  
Distribution of Active Participants (Excludes DROP Participants) as of July 1, 2018 -- Police (Plan 67)**

*AVERAGE SALARY BY AGE/SERVICE*

Age	Service									Total
	Under 1	1 to 4	5 to 9	10 to 14	15 to 19	20 to 24	25 to 29	30 & Up		
Under 25	\$ 0	\$ 0	\$ 0	\$ 0	\$ 0	\$ 0	\$ 0	\$ 0	\$ 0	\$ 0
25 to 29	0	0	0	0	0	0	0	0	0	0
30 to 34	0	0	0	0	0	0	0	0	0	0
35 to 39	0	0	0	0	0	0	0	0	0	0
40 to 44	0	0	0	0	0	0	0	0	0	0
45 to 49	0	0	0	0	0	90,676	81,992	79,992		83,106
50 to 54	0	0	0	0	79,165	79,541	87,344	96,873		91,685
55 to 59	0	0	0	0	0	0	97,362	97,566		97,551
60 to 64	0	0	0	0	0	0	0	92,926		92,926
65 & up	0	0	0	0	0	0	0	107,719		107,719
<b>Total</b>	<b>\$ 0</b>	<b>\$ 0</b>	<b>\$ 0</b>	<b>\$ 0</b>	<b>\$ 79,165</b>	<b>\$ 85,109</b>	<b>\$ 89,254</b>	<b>\$ 96,427</b>		<b>\$ 95,200</b>

**CITY OF PHILADELPHIA MUNICIPAL RETIREMENT SYSTEM  
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**APPENDIX A – MEMBERSHIP INFORMATION**

**Table A-11  
Distribution of Active Participants (Excludes DROP Participants) as of July 1, 2018 -- Fire (Plan 67)**

*COUNTS BY AGE/SERVICE*

Age	Service									Total
	Under 1	1 to 4	5 to 9	10 to 14	15 to 19	20 to 24	25 to 29	30 & Up		
Under 25	0	0	0	0	0	0	0	0	0	0
25 to 29	0	0	0	0	0	0	0	0	0	0
30 to 34	0	0	0	0	0	0	0	0	0	0
35 to 39	0	0	0	0	0	0	0	0	0	0
40 to 44	0	0	0	0	0	0	0	0	0	0
45 to 49	0	0	0	0	0	0	0	0	1	1
50 to 54	0	0	0	0	0	0	7	6		13
55 to 59	0	0	0	0	0	0	3	35		38
60 to 64	0	0	0	0	0	0	0	20		20
65 & up	0	0	0	0	0	0	0	5		5
<b>Total</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>10</b>	<b>67</b>		<b>77</b>

**Table A-12  
Distribution of Active Participants (Excludes DROP Participants) as of July 1, 2018 -- Fire (Plan 67)**

*AVERAGE SALARY BY AGE/SERVICE*

Age	Service									Total
	Under 1	1 to 4	5 to 9	10 to 14	15 to 19	20 to 24	25 to 29	30 & Up		
Under 25	\$ 0	\$ 0	\$ 0	\$ 0	\$ 0	\$ 0	\$ 0	\$ 0	\$ 0	\$ 0
25 to 29	0	0	0	0	0	0	0	0	0	0
30 to 34	0	0	0	0	0	0	0	0	0	0
35 to 39	0	0	0	0	0	0	0	0	0	0
40 to 44	0	0	0	0	0	0	0	0	0	0
45 to 49	0	0	0	0	0	0	0	104,385		104,385
50 to 54	0	0	0	0	0	0	86,565	80,183		83,619
55 to 59	0	0	0	0	0	0	79,945	99,440		97,901
60 to 64	0	0	0	0	0	0	0	91,813		91,813
65 & up	0	0	0	0	0	0	0	108,044		108,044
<b>Total</b>	<b>\$ 0</b>	<b>\$ 84,579</b>	<b>\$ 96,154</b>		<b>\$ 94,651</b>					

**CITY OF PHILADELPHIA MUNICIPAL RETIREMENT SYSTEM  
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**APPENDIX A – MEMBERSHIP INFORMATION**

**Table A-13  
Distribution of Active Participants (Excludes DROP Participants) as of July 1, 2018 -- Municipal (Plan 87)**

*COUNTS BY AGE/SERVICE*

Age	Service									Total
	Under 1	1 to 4	5 to 9	10 to 14	15 to 19	20 to 24	25 to 29	30 & Up		
Under 25	88	190	16	1	0	0	0	0	0	295
25 to 29	142	692	315	69	1	0	0	0	0	1,219
30 to 34	98	663	767	414	39	0	0	0	0	1,981
35 to 39	66	443	520	734	294	30	0	0	0	2,087
40 to 44	29	308	385	584	489	175	24	0	0	1,994
45 to 49	33	270	341	497	591	492	88	11	0	2,323
50 to 54	31	250	283	512	484	557	129	48	0	2,294
55 to 59	19	177	248	489	500	492	129	90	0	2,144
60 to 64	10	160	204	300	230	232	47	43	0	1,226
65 & up	10	77	126	170	104	72	12	20	0	591
<b>Total</b>	<b>526</b>	<b>3,230</b>	<b>3,205</b>	<b>3,770</b>	<b>2,732</b>	<b>2,050</b>	<b>429</b>	<b>212</b>	<b>0</b>	<b>16,154</b>

**Table A-14  
Distribution of Active Participants (Excludes DROP Participants) as of July 1, 2018 -- Municipal (Plan 87)**

*AVERAGE SALARY BY AGE/SERVICE*

Age	Service									Total
	Under 1	1 to 4	5 to 9	10 to 14	15 to 19	20 to 24	25 to 29	30 & Up		
Under 25	\$ 23,071	\$ 27,254	\$ 36,700	\$ 31,138	\$ 0	\$ 0	\$ 0	\$ 0	\$ 0	\$ 26,532
25 to 29	41,334	47,186	49,870	49,599	65,860	0	0	0	0	47,350
30 to 34	49,957	51,815	59,589	56,404	49,683	0	0	0	0	55,650
35 to 39	57,926	52,054	60,425	60,620	59,543	55,809	0	0	0	58,447
40 to 44	58,351	53,608	59,027	64,200	66,457	61,849	63,714	0	0	61,821
45 to 49	46,984	51,139	57,992	60,120	63,809	67,291	65,801	61,645	0	61,257
50 to 54	60,919	51,238	55,817	57,709	59,715	63,293	65,281	69,245	0	59,260
55 to 59	56,503	51,539	53,834	53,285	55,789	62,181	63,697	61,840	0	56,844
60 to 64	40,359	48,535	51,223	52,984	57,784	58,866	59,729	68,701	0	54,831
65 & up	93,107	55,053	48,104	45,895	51,341	46,033	76,065	48,205	0	50,024
<b>Total</b>	<b>\$ 45,928</b>	<b>\$ 49,381</b>	<b>\$ 56,655</b>	<b>\$ 57,818</b>	<b>\$ 60,448</b>	<b>\$ 62,646</b>	<b>\$ 64,517</b>	<b>\$ 63,612</b>	<b>\$ 0</b>	<b>\$ 56,824</b>

**CITY OF PHILADELPHIA MUNICIPAL RETIREMENT SYSTEM  
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**APPENDIX A – MEMBERSHIP INFORMATION**

**Table A-15  
Distribution of Active Participants (Excludes DROP Participants) as of July 1, 2018 -- Elected (Plan 87)**

*COUNTS BY AGE/SERVICE*

Age	Service									Total
	Under 1	1 to 4	5 to 9	10 to 14	15 to 19	20 to 24	25 to 29	30 & Up		
Under 25	0	0	0	0	0	0	0	0	0	0
25 to 29	0	0	0	0	0	0	0	0	0	0
30 to 34	0	0	0	0	0	0	0	0	0	0
35 to 39	0	0	0	0	0	0	0	0	0	0
40 to 44	0	0	0	0	0	0	0	0	0	0
45 to 49	0	0	3	0	1	1	0	0	0	5
50 to 54	0	1	2	0	1	0	0	0	1	5
55 to 59	1	0	1	0	0	0	0	0	1	3
60 to 64	0	0	0	1	0	1	1	1	0	3
65 & up	0	0	0	0	0	0	1	7	0	8
<b>Total</b>	<b>1</b>	<b>1</b>	<b>6</b>	<b>1</b>	<b>2</b>	<b>2</b>	<b>2</b>	<b>9</b>	<b>0</b>	<b>24</b>

**Table A-16  
Distribution of Active Participants (Excludes DROP Participants) as of July 1, 2018 -- Elected (Plan 87)**

*AVERAGE SALARY BY AGE/SERVICE*

Age	Service									Total
	Under 1	1 to 4	5 to 9	10 to 14	15 to 19	20 to 24	25 to 29	30 & Up		
Under 25	\$ 0	\$ 0	\$ 0	\$ 0	\$ 0	\$ 0	\$ 0	\$ 0	\$ 0	\$ 0
25 to 29	0	0	0	0	0	0	0	0	0	0
30 to 34	0	0	0	0	0	0	0	0	0	0
35 to 39	0	0	0	0	0	0	0	0	0	0
40 to 44	0	0	0	0	0	0	0	0	0	0
45 to 49	0	0	132,850	0	129,760	129,760	0	0	0	131,614
50 to 54	0	129,760	134,395	0	135,000	0	0	129,760	0	132,662
55 to 59	179,299	0	129,760	0	0	0	0	132,408	0	147,156
60 to 64	0	0	0	129,760	0	129,760	218,474	0	0	159,331
65 & up	0	0	0	0	0	0	100,104	136,759	0	132,177
<b>Total</b>	<b>\$ 179,299</b>	<b>\$ 129,760</b>	<b>\$ 132,850</b>	<b>\$ 129,760</b>	<b>\$ 132,380</b>	<b>\$ 129,760</b>	<b>\$ 159,289</b>	<b>\$ 135,498</b>	<b>\$ 0</b>	<b>\$ 137,427</b>

**CITY OF PHILADELPHIA MUNICIPAL RETIREMENT SYSTEM  
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**APPENDIX A – MEMBERSHIP INFORMATION**

**Table A-17  
Distribution of Active Participants (Excludes DROP Participants) as of July 1, 2018 -- Police (Plan 87)**

*COUNTS BY AGE/SERVICE*

Age	Service								Total
	Under 1	1 to 4	5 to 9	10 to 14	15 to 19	20 to 24	25 to 29	30 & Up	
Under 25	73	68	1	0	0	0	0	0	142
25 to 29	151	455	93	14	0	0	0	0	713
30 to 34	53	181	265	249	7	0	0	0	755
35 to 39	16	52	140	363	208	5	0	0	784
40 to 44	12	28	62	194	383	284	1	0	964
45 to 49	2	8	33	123	213	612	188	2	1,181
50 to 54	2	2	5	36	101	361	415	3	925
55 to 59	0	0	2	2	31	121	168	3	327
60 to 64	0	1	1	1	8	23	51	2	87
65 & up	0	0	0	0	2	3	4	0	9
<b>Total</b>	<b>309</b>	<b>795</b>	<b>602</b>	<b>982</b>	<b>953</b>	<b>1,409</b>	<b>827</b>	<b>10</b>	<b>5,887</b>

**Table A-18  
Distribution of Active Participants (Excludes DROP Participants) as of July 1, 2018 -- Police (Plan 87)**

*AVERAGE SALARY BY AGE/SERVICE*

Age	Service								Total
	Under 1	1 to 4	5 to 9	10 to 14	15 to 19	20 to 24	25 to 29	30 & Up	
Under 25	\$ 55,355	\$ 63,398	\$ 54,150	\$ 0	\$ 0	\$ 0	\$ 0	\$ 0	\$ 59,198
25 to 29	55,798	67,485	75,880	73,284	0	0	0	0	66,219
30 to 34	55,462	70,251	78,948	80,394	77,914	0	0	0	75,681
35 to 39	55,324	69,097	78,946	81,179	83,557	82,271	0	0	80,089
40 to 44	56,029	68,580	79,082	80,072	82,614	83,964	79,541	0	81,531
45 to 49	54,150	68,819	78,293	79,723	81,344	84,779	87,471	83,518	83,718
50 to 54	54,150	68,901	78,111	80,793	81,554	82,743	88,460	82,658	84,985
55 to 59	0	0	78,111	78,637	80,866	82,905	86,410	86,529	84,490
60 to 64	0	74,626	84,132	78,637	80,479	82,237	84,299	83,537	83,207
65 & up	0	0	0	0	79,165	79,541	82,792	0	80,902
<b>Total</b>	<b>\$ 55,599</b>	<b>\$ 67,935</b>	<b>\$ 78,409</b>	<b>\$ 80,445</b>	<b>\$ 82,307</b>	<b>\$ 83,870</b>	<b>\$ 87,524</b>	<b>\$ 84,167</b>	<b>\$ 79,365</b>

**CITY OF PHILADELPHIA MUNICIPAL RETIREMENT SYSTEM  
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**APPENDIX A – MEMBERSHIP INFORMATION**

**Table A-19  
Distribution of Active Participants (Excludes DROP Participants) as of July 1, 2018 -- Fire (Plan 87)**

*COUNTS BY AGE/SERVICE*

Age	Service									Total
	Under 1	1 to 4	5 to 9	10 to 14	15 to 19	20 to 24	25 to 29	30 & Up		
Under 25	5	17	1	0	0	0	0	0	0	23
25 to 29	27	167	21	4	0	0	0	0	0	219
30 to 34	22	210	78	86	4	0	0	0	0	400
35 to 39	11	118	50	186	40	3	0	0	0	408
40 to 44	7	39	25	109	108	25	0	0	0	313
45 to 49	4	19	7	77	118	135	15	0	0	375
50 to 54	0	7	5	34	51	134	77	1	0	309
55 to 59	0	1	2	7	17	54	57	2	0	140
60 to 64	0	0	0	1	3	8	13	0	0	25
65 & up	0	0	0	1	1	1	1	0	0	4
<b>Total</b>	<b>76</b>	<b>578</b>	<b>189</b>	<b>505</b>	<b>342</b>	<b>360</b>	<b>163</b>	<b>3</b>	<b>3</b>	<b>2,216</b>

**Table A-20  
Distribution of Active Participants (Excludes DROP Participants) as of July 1, 2018 -- Fire (Plan 87)**

*AVERAGE SALARY BY AGE/SERVICE*

Age	Service									Total
	Under 1	1 to 4	5 to 9	10 to 14	15 to 19	20 to 24	25 to 29	30 & Up		
Under 25	\$ 54,150	\$ 60,780	\$ 60,108	\$ 0	\$ 0	\$ 0	\$ 0	\$ 0	\$ 0	\$ 59,309
25 to 29	54,150	63,824	77,440	64,229	0	0	0	0	0	63,945
30 to 34	54,150	66,023	79,354	80,070	78,199	0	0	0	0	71,111
35 to 39	54,150	66,880	79,892	81,506	82,508	71,697	0	0	0	76,367
40 to 44	54,150	66,300	79,350	81,672	85,757	87,324	0	0	0	80,817
45 to 49	54,150	64,235	78,243	80,361	85,429	89,857	92,512	0	0	84,724
50 to 54	0	65,736	81,156	79,367	83,220	87,585	92,107	115,511	0	86,578
55 to 59	0	58,266	78,065	79,632	84,457	90,181	93,320	79,945	0	89,689
60 to 64	0	0	0	89,594	85,447	82,276	94,444	0	0	89,277
65 & up	0	0	0	89,594	87,029	79,494	79,945	0	0	84,016
<b>Total</b>	<b>\$ 54,150</b>	<b>\$ 65,351</b>	<b>\$ 79,174</b>	<b>\$ 80,848</b>	<b>\$ 84,733</b>	<b>\$ 88,535</b>	<b>\$ 92,680</b>	<b>\$ 91,800</b>	<b>\$ 91,800</b>	<b>\$ 78,481</b>

**CITY OF PHILADELPHIA MUNICIPAL RETIREMENT SYSTEM  
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**APPENDIX A – MEMBERSHIP INFORMATION**

**Table A-21  
Distribution of Active Participants (Excludes DROP Participants) as of July 1, 2018 -- Municipal (Plan 10)**

*COUNTS BY AGE/SERVICE*

Age	Service								Total
	Under 1	1 to 4	5 to 9	10 to 14	15 to 19	20 to 24	25 to 29	30 & Up	
Under 25	16	79	0	0	0	0	0	0	95
25 to 29	58	331	0	0	0	0	0	0	389
30 to 34	48	257	2	0	0	0	0	0	307
35 to 39	18	156	0	0	0	0	0	0	174
40 to 44	11	118	0	0	0	0	0	0	129
45 to 49	11	99	1	0	0	0	0	0	111
50 to 54	6	84	0	0	0	0	0	0	90
55 to 59	12	76	0	0	0	0	0	0	88
60 to 64	8	41	0	0	0	0	0	0	49
65 & up	5	19	1	0	0	0	0	0	25
<b>Total</b>	<b>193</b>	<b>1,260</b>	<b>4</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>1,457</b>

**Table A-22  
Distribution of Active Participants (Excludes DROP Participants) as of July 1, 2018 -- Municipal (Plan 10)**

*AVERAGE SALARY BY AGE/SERVICE*

Age	Service								Total
	Under 1	1 to 4	5 to 9	10 to 14	15 to 19	20 to 24	25 to 29	30 & Up	
Under 25	\$ 33,011	\$ 39,525	\$ 0	\$ 0	\$ 0	\$ 0	\$ 0	\$ 0	\$ 38,428
25 to 29	39,891	46,723	0	0	0	0	0	0	45,705
30 to 34	49,781	52,475	45,169	0	0	0	0	0	52,006
35 to 39	62,326	53,903	0	0	0	0	0	0	54,774
40 to 44	54,900	58,382	0	0	0	0	0	0	58,085
45 to 49	51,334	56,164	73,679	0	0	0	0	0	55,844
50 to 54	43,674	50,546	0	0	0	0	0	0	50,088
55 to 59	81,809	51,483	0	0	0	0	0	0	55,618
60 to 64	77,709	63,182	0	0	0	0	0	0	65,554
65 & up	80,131	58,758	61,800	0	0	0	0	0	63,155
<b>Total</b>	<b>\$ 50,715</b>	<b>\$ 51,427</b>	<b>\$ 56,454</b>	<b>\$ 0</b>	<b>\$ 51,346</b>				

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**APPENDIX A – MEMBERSHIP INFORMATION**

**Table A-23  
Distribution of Active Participants (Excludes DROP Participants) as of July 1, 2018 -- Municipal (Plan 16)**

*COUNTS BY AGE/SERVICE*

Age	Service								Total
	Under 1	1 to 4	5 to 9	10 to 14	15 to 19	20 to 24	25 to 29	30 & Up	
Under 25	84	59	0	0	0	0	0	0	143
25 to 29	198	138	0	0	0	0	0	0	336
30 to 34	163	111	0	0	0	0	0	0	274
35 to 39	122	72	0	0	0	0	0	0	194
40 to 44	82	72	0	0	0	0	0	0	154
45 to 49	74	96	0	0	0	0	0	0	170
50 to 54	70	48	0	0	0	0	0	0	118
55 to 59	57	35	0	0	0	0	0	0	92
60 to 64	37	27	0	0	0	0	0	0	64
65 & up	13	15	0	0	0	0	0	0	28
<b>Total</b>	<b>900</b>	<b>673</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>1,573</b>

**Table A-24  
Distribution of Active Participants (Excludes DROP Participants) as of July 1, 2018 -- Municipal (Plan 16)**

*AVERAGE SALARY BY AGE/SERVICE*

Age	Service								Total
	Under 1	1 to 4	5 to 9	10 to 14	15 to 19	20 to 24	25 to 29	30 & Up	
Under 25	\$ 32,720	\$ 33,592	\$ 0	\$ 0	\$ 0	\$ 0	\$ 0	\$ 0	\$ 33,079
25 to 29	34,747	39,011	0	0	0	0	0	0	36,498
30 to 34	33,474	37,609	0	0	0	0	0	0	35,149
35 to 39	32,865	36,922	0	0	0	0	0	0	34,371
40 to 44	32,043	38,141	0	0	0	0	0	0	34,894
45 to 49	29,549	38,141	0	0	0	0	0	0	34,401
50 to 54	30,506	39,788	0	0	0	0	0	0	34,282
55 to 59	26,948	36,986	0	0	0	0	0	0	30,767
60 to 64	25,979	35,676	0	0	0	0	0	0	30,070
65 & up	23,571	36,701	0	0	0	0	0	0	30,605
<b>Total</b>	<b>\$ 32,053</b>	<b>\$ 37,629</b>	<b>\$ 0</b>	<b>\$ 34,438</b>					

**CITY OF PHILADELPHIA MUNICIPAL RETIREMENT SYSTEM  
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**APPENDIX A – MEMBERSHIP INFORMATION**

<b>Table A-25 Reconciliation of Plan Membership</b>										
	1967 Plan			Plan 87				Plan '10	Plan '16	Total City
	Municipal	Police	Fire	Municipal	Elected	Police	Fire	Municipal	Municipal	
<b>Active</b>										
Active July 1, 2017	<b>1,497</b>	<b>294</b>	<b>93</b>	<b>16,913</b>	<b>25</b>	<b>5,698</b>	<b>2,180</b>	<b>1,312</b>	<b>603</b>	<b>28,615</b>
New Entrants and Rehires	6	0	2	959	1	431	90	345	1,062	2,896
Refunded Contributions	0	0	0	-283	0	-22	-5	-66	-29	-405
Non-Vested Terminations	-2	0	0	-125	0	-17	-5	-62	-25	-236
Terminated Vested	-2	0	0	-5	-1	0	0	-1	0	-9
Became Disabled	0	0	0	-33	0	-17	-3	0	0	-53
Retired	-52	-3	0	-145	-1	-22	-5	0	0	-228
Entered DROP	-211	-47	-18	-281	0	-85	-18	0	0	-660
Net Other Terminations	-22	-1	0	-846	0	-79	-18	-71	-38	-1,075
Active July 1, 2018	<b>1,214</b>	<b>243</b>	<b>77</b>	<b>16,154</b>	<b>24</b>	<b>5,887</b>	<b>2,216</b>	<b>1,457</b>	<b>1,573</b>	<b>28,845</b>
<b>Retired</b>										
Retired July 1, 2017	<b>12,367</b>	<b>5,150</b>	<b>1,912</b>	<b>2,293</b>	<b>19</b>	<b>398</b>	<b>149</b>	<b>0</b>	<b>0</b>	<b>22,288</b>
New Retirees	311	67	14	347	1	80	15	0	0	835
Died with Beneficiary Payable	-124	-72	-20	-3	0	-1	0	0	0	-220
Died without Beneficiary Payable	-414	-111	-36	-45	-1	-1	-1	0	0	-609
Net Other Terminations	-6	0	0	-7	0	-3	-3	0	0	-19
Retired July 1, 2018	<b>12,134</b>	<b>5,034</b>	<b>1,870</b>	<b>2,585</b>	<b>19</b>	<b>473</b>	<b>160</b>	<b>0</b>	<b>0</b>	<b>22,275</b>
<b>Beneficiary</b>										
Beneficiary July 1, 2017	<b>4,837</b>	<b>2,290</b>	<b>789</b>	<b>419</b>	<b>4</b>	<b>152</b>	<b>61</b>	<b>0</b>	<b>0</b>	<b>8,552</b>
New Beneficiaries	195	120	31	47	0	14	7	0	0	414
Deaths	-238	-119	-44	-5	0	-2	0	0	0	-408
Net Other Terminations	-6	0	-2	-3	0	0	0	0	0	-11
Beneficiary July 1, 2018	<b>4,788</b>	<b>2,291</b>	<b>774</b>	<b>458</b>	<b>4</b>	<b>164</b>	<b>68</b>	<b>0</b>	<b>0</b>	<b>8,547</b>

**CITY OF PHILADELPHIA MUNICIPAL RETIREMENT SYSTEM  
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**APPENDIX A – MEMBERSHIP INFORMATION**

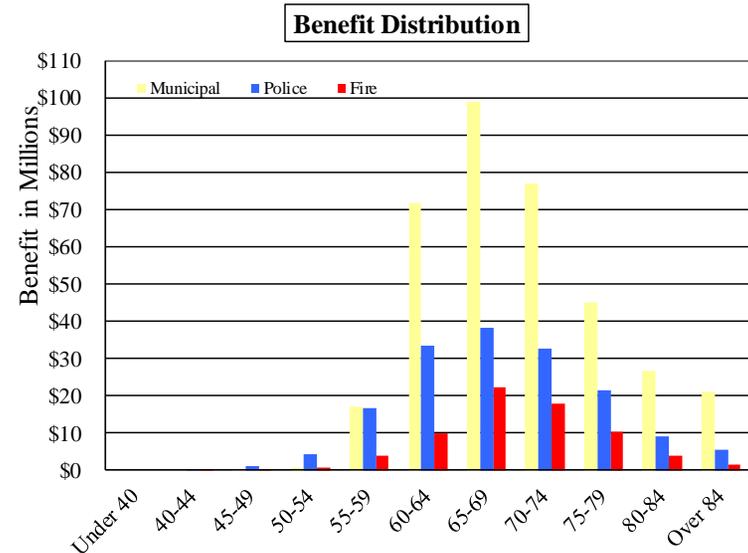
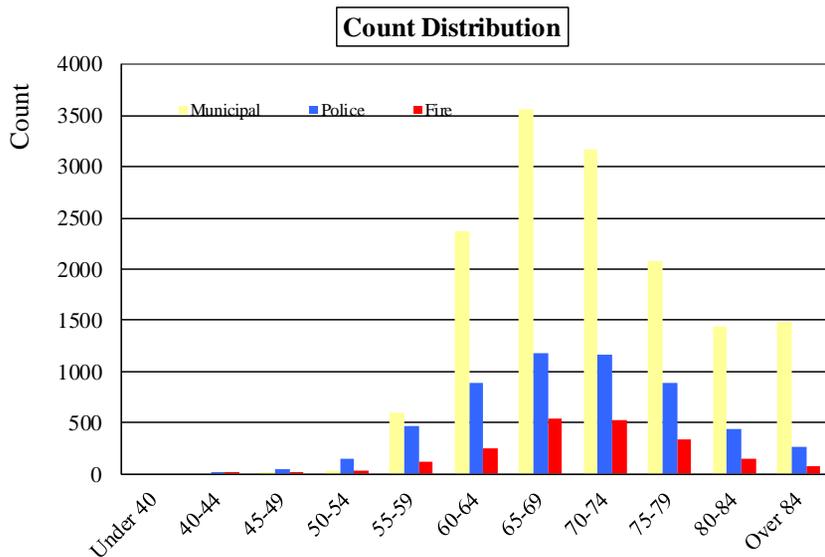
<b>Table A-25 Reconciliation of Plan Membership (continued)</b>										
	1967 Plan			Plan 87				Plan '10	Plan '16	Total City
	Municipal	Police	Fire	Municipal	Elected	Police	Fire	Municipal	Municipal	
<b>Disabled</b>										
Disabled July 1, 2017	<b>1,401</b>	<b>1,258</b>	<b>288</b>	<b>488</b>	<b>0</b>	<b>431</b>	<b>76</b>	<b>0</b>	<b>0</b>	<b>3,942</b>
New Disabilities	5	1	0	52	0	33	7	0	0	98
Died with Beneficiary Payable	-6	-17	-1	-2	0	-2	-1	0	0	-29
Died without Beneficiary Payable	-55	-39	-12	-10	0	0	0	0	0	-116
Net Other Terminations	0	-2	0	0	0	-1	-2	0	0	-5
Disabled July 1, 2018	<b>1,345</b>	<b>1,201</b>	<b>275</b>	<b>528</b>	<b>0</b>	<b>461</b>	<b>80</b>	<b>0</b>	<b>0</b>	<b>3,890</b>
<b>Terminated Vested</b>										
Terminated Vested July 1, 2017	<b>265</b>	<b>1</b>	<b>0</b>	<b>781</b>	<b>0</b>	<b>96</b>	<b>14</b>	<b>0</b>	<b>0</b>	<b>1,157</b>
New Vested Terminations	3	0	0	8	0	0	0	0	0	11
Retired	-34	0	0	-27	0	-14	-1	0	0	-76
Net Other Terminations	-7	0	0	-10	0	0	-1	0	0	-18
Terminated Vested July 1, 2018	<b>227</b>	<b>1</b>	<b>0</b>	<b>752</b>	<b>0</b>	<b>82</b>	<b>12</b>	<b>0</b>	<b>0</b>	<b>1,074</b>
<b>DROP</b>										
DROP July 1, 2017	<b>761</b>	<b>185</b>	<b>60</b>	<b>532</b>	<b>1</b>	<b>180</b>	<b>48</b>	<b>0</b>	<b>0</b>	<b>1,767</b>
New DROP Participants	211	47	17	281	0	85	19	0	0	660
Retired	-213	-60	-13	-140	0	-42	-6	0	0	-474
Net Other Terminations	-1	0	0	-4	0	-4	0	0	0	-9
DROP July 1, 2018	<b>758</b>	<b>172</b>	<b>64</b>	<b>669</b>	<b>1</b>	<b>219</b>	<b>61</b>	<b>0</b>	<b>0</b>	<b>1,944</b>

**CITY OF PHILADELPHIA MUNICIPAL RETIREMENT SYSTEM  
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**APPENDIX A – MEMBERSHIP INFORMATION**

**Table A-26  
Age Distribution of Retired Members as of July 1, 2018**

Age	Municipal		Police		Fire	
	Count	Annual Pensions	Count	Annual Pensions	Count	Annual Pensions
Under 40	0	\$ 0	0	\$ 0	0	\$ 0
40-44	0	0	3	71,365	2	19,123
45-49	1	9,206	42	1,229,364	2	22,527
50-54	35	795,486	150	4,346,862	31	858,008
55-59	594	17,221,492	470	16,675,732	116	4,064,830
60-64	2,375	71,917,572	895	33,685,738	256	10,125,939
65-69	3,565	98,983,101	1,184	38,277,507	536	22,367,785
70-74	3,166	76,877,536	1,165	32,847,060	526	18,050,401
75-79	2,083	44,904,454	886	21,593,398	331	10,179,722
80-84	1,435	26,639,293	440	9,192,786	153	3,853,129
Over 84	1,484	20,948,785	272	5,473,747	77	1,602,069
<b>Total</b>	<b>14,738</b>	<b>358,296,925</b>	<b>5,507</b>	<b>163,393,559</b>	<b>2,030</b>	<b>71,143,533</b>

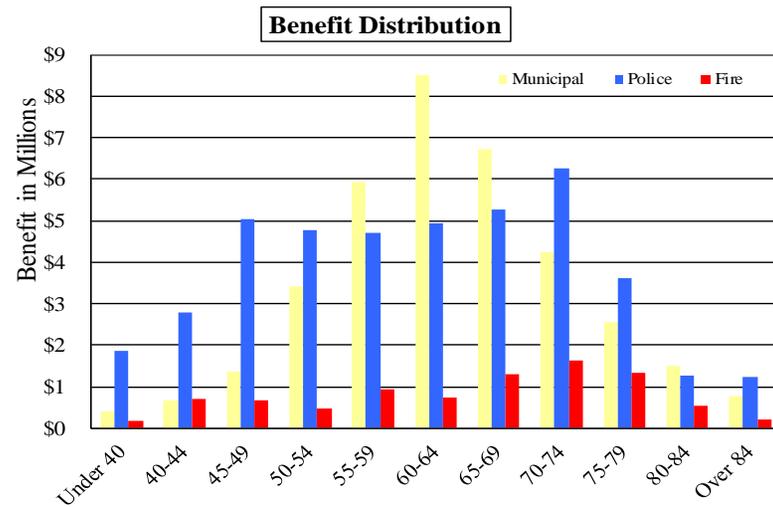
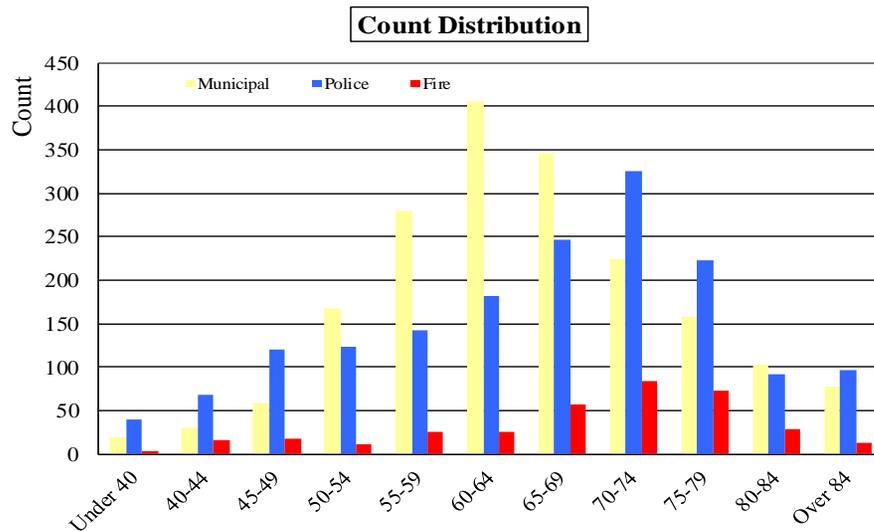


**CITY OF PHILADELPHIA MUNICIPAL RETIREMENT SYSTEM  
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**APPENDIX A – MEMBERSHIP INFORMATION**

**Table A-27  
Age Distribution of Disabled Members as of July 1, 2018**

Age	Municipal		Police		Fire	
	Count	Annual Pensions	Count	Annual Pensions	Count	Annual Pensions
Under 40	19	\$ 418,123	40	\$ 1,849,020	4	\$ 171,657
40-44	30	657,682	69	2,795,387	16	704,315
45-49	59	1,355,838	121	5,038,797	18	682,241
50-54	167	3,410,614	123	4,768,079	11	471,939
55-59	280	5,932,353	143	4,718,546	25	932,117
60-64	407	8,498,574	182	4,925,343	26	744,941
65-69	347	6,734,507	247	5,263,963	57	1,296,440
70-74	225	4,238,869	325	6,249,186	84	1,622,543
75-79	158	2,557,020	223	3,627,706	73	1,344,610
80-84	103	1,485,283	92	1,272,983	28	542,620
Over 84	78	774,713	97	1,234,212	13	216,937
<b>Total</b>	<b>1,873</b>	<b>36,063,576</b>	<b>1,662</b>	<b>41,743,222</b>	<b>355</b>	<b>8,730,360</b>

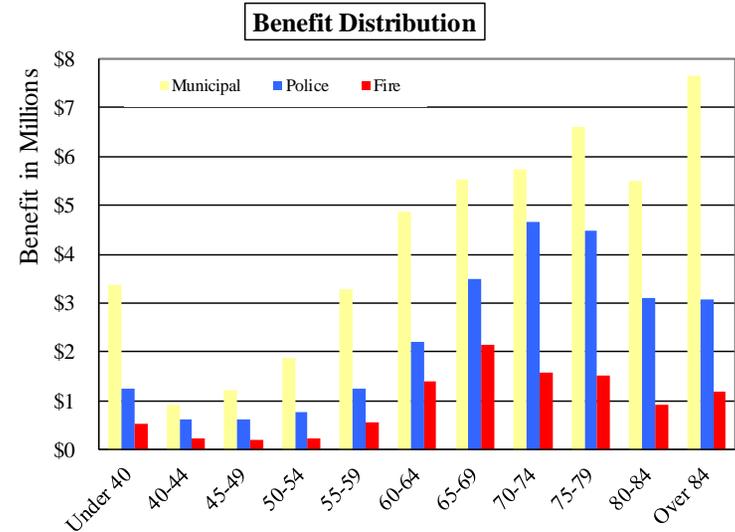
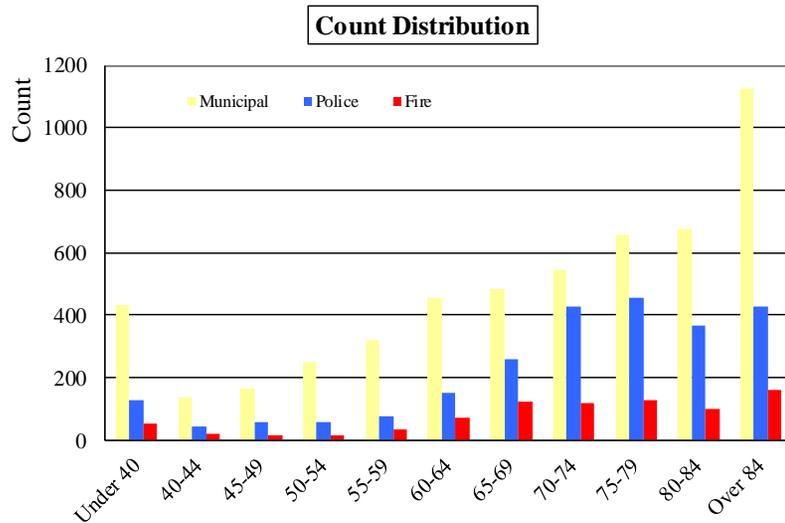


**CITY OF PHILADELPHIA MUNICIPAL RETIREMENT SYSTEM  
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**APPENDIX A – MEMBERSHIP INFORMATION**

**Table A-28  
Age Distribution of Beneficiaries as of July 1, 2018**

Age	Municipal		Police		Fire	
	Count	Annual Pensions	Count	Annual Pensions	Count	Annual Pensions
Under 40	434	\$ 3,357,423	129	\$ 1,249,220	52	\$ 539,215
40-44	140	927,092	46	619,420	22	222,860
45-49	165	1,215,865	56	603,351	16	203,786
50-54	248	1,880,614	56	755,580	15	225,133
55-59	321	3,291,152	76	1,250,454	34	553,380
60-64	457	4,883,710	151	2,216,882	73	1,404,018
65-69	483	5,519,165	261	3,497,660	123	2,152,811
70-74	545	5,732,506	429	4,654,815	117	1,584,888
75-79	656	6,616,899	454	4,472,145	127	1,503,895
80-84	676	5,510,380	369	3,112,135	102	925,960
Over 84	1,125	7,641,455	428	3,075,680	161	1,175,850
Total	5,250	46,576,261	2,455	25,507,342	842	10,491,796



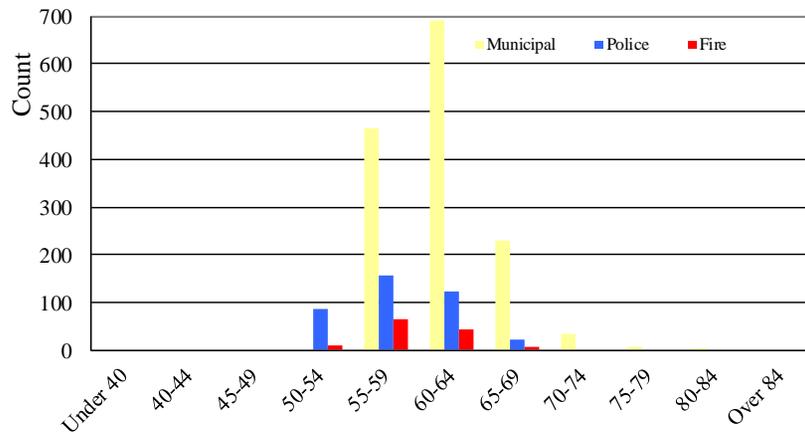
**CITY OF PHILADELPHIA MUNICIPAL RETIREMENT SYSTEM  
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**APPENDIX A – MEMBERSHIP INFORMATION**

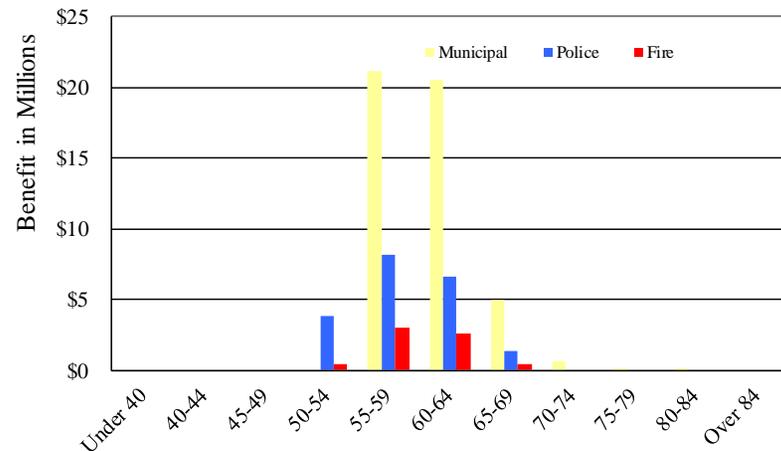
**Table A-29  
Age Distribution of DROP Participants as of July 1, 2018**

Age	Municipal		Police		Fire	
	Count	Annual Pensions	Count	Annual Pensions	Count	Annual Pensions
Under 40	0	\$ 0	0	\$ 0	0	\$ 0
40-44	0	0	0	0	0	0
45-49	0	0	0	0	0	0
50-54	0	0	87	3,821,164	9	453,528
55-59	466	21,157,659	158	8,123,615	64	3,046,433
60-64	691	20,532,538	123	6,564,550	45	2,626,424
65-69	230	5,003,425	23	1,320,594	7	431,472
70-74	34	628,158	0	0	0	0
75-79	6	102,504	0	0	0	0
80-84	1	6,552	0	0	0	0
Over 84	0	0	0	0	0	0
<b>Total</b>	<b>1,428</b>	<b>47,430,836</b>	<b>391</b>	<b>19,829,923</b>	<b>125</b>	<b>6,557,857</b>

**Count Distribution**



**Benefit Distribution**

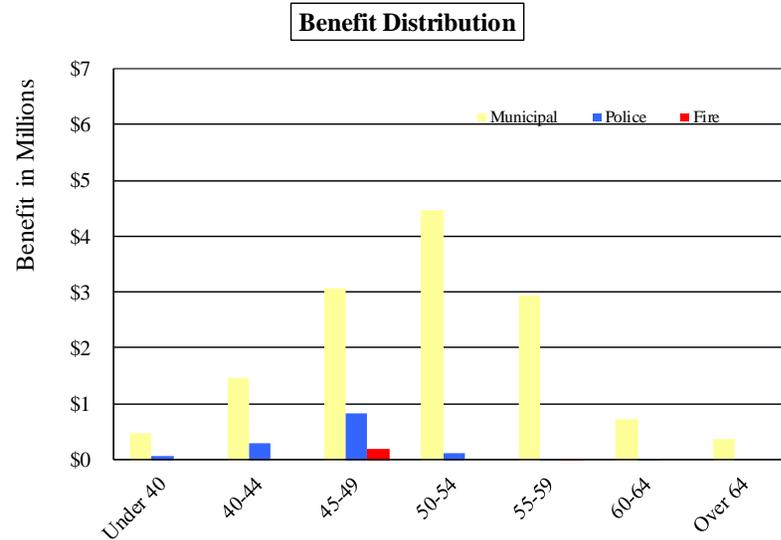
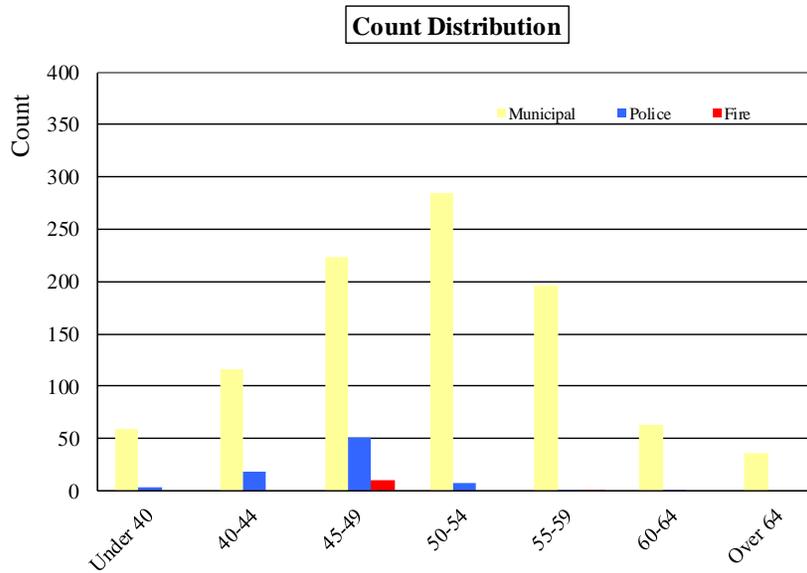


**CITY OF PHILADELPHIA MUNICIPAL RETIREMENT SYSTEM  
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**APPENDIX A – MEMBERSHIP INFORMATION**

**Table A-30  
Age Distribution of Terminated Vested Members as of July 1, 2018**

Age	Municipal		Police		Fire	
	Count	Annual Pensions	Count	Annual Pensions	Count	Annual Pensions
Under 40	59	\$ 467,708	4	\$ 60,689	0	\$ 0
40-44	116	1,470,239	19	291,966	0	0
45-49	223	3,057,345	51	823,866	11	180,394
50-54	285	4,467,895	7	119,449	0	0
55-59	197	2,933,979	1	15,264	1	10,687
60-64	63	737,559	1	13,436	0	0
Over 64	36	359,407	0	0	0	0
<b>Total</b>	<b>979</b>	<b>13,494,132</b>	<b>83</b>	<b>1,324,670</b>	<b>12</b>	<b>191,081</b>



**CITY OF PHILADELPHIA MUNICIPAL RETIREMENT SYSTEM  
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**APPENDIX B – SUPPORTING TABLES FOR CITY’S FUNDING POLICY**

Appendix B provides supporting information on the amortization payments under the City’s Funding Policy by each plan.

<b>Table B-1a</b>					
<b>Development of the Fiscal Year 2020 Amortization Payment under the City's Funding Policy</b>					
<b>1967 Plan - Municipal</b>					
<b>(\$ thousands)</b>					
	<b>7/1/2018</b>	<b>7/1/2019</b>	<b>Remaining</b>	<b>FY 2020 Payment</b>	<b>FY 2020 Payment</b>
	<b>Outstanding Balance</b>	<b>Expected Balance</b>	<b>Years</b>	<b>Beginning-of-Year</b>	<b>End-of-Year</b>
1. Expected Unfunded Actuarial Liability (UAL) as of July 1, 2018 Based on July 1, 2017 Valuation					
a. Remaining	\$ 2,621,458	\$ 2,305,807		\$ 322,365	\$ 346,865
2. Changes in UAL due to					
a. Actuarial Experience	\$ 196,158	\$ 211,066	20	\$ 19,388	\$ 20,862
b. Assumption Changes	35,162	37,835	15	4,008	4,313
c. Active Plan Changes	0	0	10	0	0
d. Inactive Plan Changes	0	0	1	0	0
e. Subtotal	\$ 231,321	\$ 248,901		\$ 23,396	\$ 25,175
3. Total [1c. + 2e.]	\$ 2,852,778	\$ 2,554,708		\$ 345,762	\$ 372,040

**CITY OF PHILADELPHIA MUNICIPAL RETIREMENT SYSTEM  
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**APPENDIX B – SUPPORTING TABLES FOR CITY’S FUNDING POLICY**

<b>Table B-1b</b>					
<b>Development of the Fiscal Year 2020 Amortization Payment under the City's Funding Policy</b>					
<b>1967 Plan - Police</b>					
<b>(\$ thousands)</b>					
	<b>7/1/2018</b>	<b>7/1/2019</b>	<b>Remaining</b>	<b>FY 2020 Payment</b>	<b>FY 2020 Payment</b>
	<b>Outstanding Balance</b>	<b>Expected Balance</b>	<b>Years</b>	<b>Beginning-of-Year</b>	<b>End-of-Year</b>
1. Expected Unfunded Actuarial Liability (UAL) as of July 1, 2018 Based on July 1, 2017 Valuation					
a. Remaining	\$ 1,351,790	\$ 1,185,136		\$ 159,466	\$ 171,586
2. Changes in UAL due to					
a. Actuarial Experience	\$ 117,046	\$ 125,942	20	\$ 11,569	\$ 12,448
b. Assumption Changes	(1,266)	(1,362)	15	(144)	(155)
c. Active Plan Changes	0	0	10	0	0
d. Inactive Plan Changes	0	0	1	0	0
e. Subtotal	<u>\$ 115,780</u>	<u>\$ 124,579</u>		<u>\$ 11,424</u>	<u>\$ 12,293</u>
3. Total [1c. + 2e.]	\$ 1,467,570	\$ 1,309,716		\$ 170,891	\$ 183,878

**CITY OF PHILADELPHIA MUNICIPAL RETIREMENT SYSTEM  
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**APPENDIX B – SUPPORTING TABLES FOR CITY’S FUNDING POLICY**

<b>Table B-1c</b> <b>Development of the Fiscal Year 2020 Amortization Payment under the City's Funding Policy</b> <b>1967 Plan - Fire</b> <b>(\$ thousands)</b>					
	<b>7/1/2018</b>	<b>7/1/2019</b>	<b>Remaining</b>	<b>FY 2020 Payment</b>	<b>FY 2020 Payment</b>
	<b>Outstanding Balance</b>	<b>Expected Balance</b>	<b>Years</b>	<b>Beginning-of-Year</b>	<b>End-of-Year</b>
1. Expected Unfunded Actuarial Liability (UAL) as of July 1, 2018 Based on July 1, 2017 Valuation					
a. Remaining	\$ 577,217	\$ 506,215		\$ 68,724	\$ 73,947
2. Changes in UAL due to					
a. Actuarial Experience	\$ 44,925	\$ 48,339	20	\$ 4,440	\$ 4,778
b. Assumption Changes	(461)	(496)	15	(53)	(57)
c. Active Plan Changes	0	0	10	0	0
d. Inactive Plan Changes	0	0	1	0	0
e. Subtotal	\$ 44,464	\$ 47,843		\$ 4,388	\$ 4,721
3. Total [1c. + 2e.]	\$ 621,681	\$ 554,058		\$ 73,112	\$ 78,669

**CITY OF PHILADELPHIA MUNICIPAL RETIREMENT SYSTEM  
JULY 1, 2018 ACTUARIAL VALUATION**

**APPENDIX B – SUPPORTING TABLES FOR CITY’S FUNDING POLICY**

<b>Table B-1d</b>					
<b>Development of the Fiscal Year 2020 Amortization Payment under the City's Funding Policy</b>					
<b>Plan 87 - Municipal</b>					
<b>(\$ thousands)</b>					
	<b>7/1/2018</b>	<b>7/1/2019</b>	<b>Remaining</b>	<b>FY 2020 Payment</b>	<b>FY 2020 Payment</b>
	<b>Outstanding Balance</b>	<b>Expected Balance</b>	<b>Years</b>	<b>Beginning-of-Year</b>	<b>End-of-Year</b>
1. Expected Unfunded Actuarial Liability (UAL) as of July 1, 2018 Based on July 1, 2017 Valuation					
a. Remaining	\$ 625,584	\$ 591,807		\$ 70,142	\$ 75,473
2. Changes in UAL due to					
a. Actuarial Experience	\$ 47,722	\$ 51,349	20	\$ 4,717	\$ 5,075
b. Assumption Changes	104,670	112,625	15	11,932	12,838
c. Active Plan Changes	0	0	10	0	0
d. Inactive Plan Changes	0	0	1	0	0
e. Subtotal	\$ 152,392	\$ 163,974		\$ 16,648	\$ 17,914
3. Total [1c. + 2e.]	\$ 777,976	\$ 755,782		\$ 86,791	\$ 93,387

**CITY OF PHILADELPHIA MUNICIPAL RETIREMENT SYSTEM  
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**APPENDIX B – SUPPORTING TABLES FOR CITY’S FUNDING POLICY**

<b>Table B-1e</b>					
<b>Development of the Fiscal Year 2020 Amortization Payment under the City's Funding Policy</b>					
<b>Plan 87 - Elected</b>					
<b>(\$ thousands)</b>					
	<b>7/1/2018</b>	<b>7/1/2019</b>	<b>Remaining</b>	<b>FY 2020 Payment</b>	<b>FY 2020 Payment</b>
	<b>Outstanding Balance</b>	<b>Expected Balance</b>	<b>Years</b>	<b>Beginning-of-Year</b>	<b>End-of-Year</b>
1. Expected Unfunded Actuarial Liability (UAL) as of July 1, 2018 Based on July 1, 2017 Valuation					
a. Remaining	\$ 14,283	\$ 13,199		\$ 1,841	\$ 1,981
2. Changes in UAL due to					
a. Actuarial Experience	\$ (345)	\$ (371)	20	\$ (34)	\$ (37)
b. Assumption Changes	520	559	15	59	64
c. Active Plan Changes	0	0	10	0	0
d. Inactive Plan Changes	0	0	1	0	0
e. Subtotal	<u>\$ 175</u>	<u>\$ 188</u>		<u>\$ 25</u>	<u>\$ 27</u>
3. Total [1c. + 2e.]	\$ 14,458	\$ 13,387		\$ 1,866	\$ 2,008

**CITY OF PHILADELPHIA MUNICIPAL RETIREMENT SYSTEM  
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**APPENDIX B – SUPPORTING TABLES FOR CITY’S FUNDING POLICY**

<b>Table B-1f</b>					
<b>Development of the Fiscal Year 2020 Amortization Payment under the City's Funding Policy</b>					
<b>Plan 87 - Police</b>					
<b>(\$ thousands)</b>					
	<b>7/1/2018</b>	<b>7/1/2019</b>	<b>Remaining</b>	<b>FY 2020 Payment</b>	<b>FY 2020 Payment</b>
	<b>Outstanding Balance</b>	<b>Expected Balance</b>	<b>Years</b>	<b>Beginning-of-Year</b>	<b>End-of-Year</b>
1. Expected Unfunded Actuarial Liability (UAL) as of July 1, 2018 Based on July 1, 2017 Valuation					
a. Remaining	\$ 327,008	\$ 309,684		\$ 35,588	\$ 38,293
2. Changes in UAL due to					
a. Actuarial Experience	\$ 34,014	\$ 36,599	20	\$ 3,362	\$ 3,617
b. Assumption Changes	(59,053)	(63,541)	15	(6,732)	(7,243)
c. Active Plan Changes	0	0	10	0	0
d. Inactive Plan Changes	0	0	1	0	0
e. Subtotal	<u>\$ (25,039)</u>	<u>\$ (26,942)</u>		<u>\$ (3,370)</u>	<u>\$ (3,626)</u>
3. Total [1c. + 2e.]	\$ 301,969	\$ 282,742		\$ 32,218	\$ 34,667

**CITY OF PHILADELPHIA MUNICIPAL RETIREMENT SYSTEM  
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**APPENDIX B – SUPPORTING TABLES FOR CITY’S FUNDING POLICY**

<b>Table B-1g</b> <b>Development of the Fiscal Year 2020 Amortization Payment under the City's Funding Policy</b> <b>Plan 87 - Fire</b> <b>(\$ thousands)</b>					
	<b>7/1/2018</b>	<b>7/1/2019</b>	<b>Remaining</b>	<b>FY 2020 Payment</b>	<b>FY 2020 Payment</b>
	<b>Outstanding Balance</b>	<b>Expected Balance</b>	<b>Years</b>	<b>Beginning-of-Year</b>	<b>End-of-Year</b>
1. Expected Unfunded Actuarial Liability (UAL) as of July 1, 2018 Based on July 1, 2017 Valuation					
a. Remaining	\$ 93,363	\$ 87,971		\$ 10,579	\$ 11,382
2. Changes in UAL due to					
a. Actuarial Experience	\$ 13,875	\$ 14,930	20	\$ 1,371	\$ 1,476
b. Assumption Changes	(19,959)	(21,476)	15	(2,275)	(2,448)
c. Active Plan Changes	0	0	10	0	0
d. Inactive Plan Changes	0	0	1	0	0
e. Subtotal	\$ (6,084)	\$ (6,546)		\$ (904)	\$ (972)
3. Total [1c. + 2e.]	\$ 87,279	\$ 81,425		\$ 9,675	\$ 10,410

**CITY OF PHILADELPHIA MUNICIPAL RETIREMENT SYSTEM  
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**APPENDIX B – SUPPORTING TABLES FOR CITY’S FUNDING POLICY**

<b>Table B-1h</b>					
<b>Development of the Fiscal Year 2020 Amortization Payment under the City's Funding Policy</b>					
<b>Plan 10 - Municipal</b>					
<b>(\$ thousands)</b>					
	<b>7/1/2018</b>	<b>7/1/2019</b>	<b>Remaining</b>	<b>FY 2020 Payment</b>	<b>FY 2020 Payment</b>
	<b>Outstanding Balance</b>	<b>Expected Balance</b>	<b>Years</b>	<b>Beginning-of-Year</b>	<b>End-of-Year</b>
1. Expected Unfunded Actuarial Liability (UAL) as of July 1, 2018 Based on July 1, 2017 Valuation					
a. Remaining	\$ 397	\$ 386		\$ 38	\$ 41
2. Changes in UAL due to					
a. Actuarial Experience	\$ (221)	\$ (237)	20	\$ (22)	\$ (23)
b. Assumption Changes	668	719	15	76	82
c. Active Plan Changes	0	0	10	0	0
d. Inactive Plan Changes	0	0	1	0	0
e. Subtotal	<u>\$ 447</u>	<u>\$ 481</u>		<u>\$ 54</u>	<u>\$ 58</u>
3. Total [1c. + 2e.]	\$ 844	\$ 868		\$ 92	\$ 99

**CITY OF PHILADELPHIA MUNICIPAL RETIREMENT SYSTEM  
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**APPENDIX B – SUPPORTING TABLES FOR CITY’S FUNDING POLICY**

<b>Table B-1i</b> <b>Development of the Fiscal Year 2020 Amortization Payment under the City's Funding Policy</b> <b>Plan 16 - Municipal</b> <b>(\$ thousands)</b>					
	<b>7/1/2018</b>	<b>7/1/2019</b>	<b>Remaining</b>	<b>FY 2020 Payment</b>	<b>FY 2020 Payment</b>
	<b>Outstanding Balance</b>	<b>Expected Balance</b>	<b>Years</b>	<b>Beginning-of-Year</b>	<b>End-of-Year</b>
1. Expected Unfunded Actuarial Liability (UAL) as of July 1, 2018 Based on July 1, 2017 Valuation					
a. Remaining	\$ (207)	\$ (203)		\$ (19)	\$ (20)
2. Changes in UAL due to					
a. Actuarial Experience	\$ (831)	\$ (895)	20	\$ (82)	\$ (88)
b. Assumption Changes	32	35	15	4	4
c. Active Plan Changes	0	0	10	0	0
d. Inactive Plan Changes	0	0	1	0	0
e. Subtotal	<u>\$ (799)</u>	<u>\$ (860)</u>		<u>\$ (79)</u>	<u>\$ (84)</u>
3. Total [1c. + 2e.]	\$ (1,007)	\$ (1,063)		\$ (97)	\$ (105)

**CITY OF PHILADELPHIA MUNICIPAL RETIREMENT SYSTEM  
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**APPENDIX B – SUPPORTING TABLES FOR CITY’S FUNDING POLICY**

<b>Table B-1j</b>					
<b>Development of the Fiscal Year 2020 Amortization Payment under the City's Funding Policy</b>					
<b>Total - All Divisions</b>					
<b>(\$ thousands)</b>					
	<b>7/1/2018</b>	<b>7/1/2019</b>	<b>Remaining</b>	<b>FY 2020 Payment</b>	<b>FY 2020 Payment</b>
	<b>Outstanding Balance</b>	<b>Expected Balance</b>	<b>Years</b>	<b>Beginning-of-Year</b>	<b>End-of-Year</b>
1. Expected Unfunded Actuarial Liability (UAL) as of July 1, 2018 Based on July 1, 2017 Valuation					
a. Remaining	\$ 5,610,891	\$ 5,000,003		\$ 668,724	\$ 719,547
2. Changes in UAL due to					
a. Actuarial Experience	\$ 452,343	\$ 486,721	20	\$ 44,709	\$ 48,107
b. Assumption Changes	60,314	64,898	15	6,875	7,398
c. Active Plan Changes	0	0	10	0	0
d. Inactive Plan Changes	0	0	1	0	0
e. Subtotal	<u>\$ 512,657</u>	<u>\$ 551,619</u>		<u>\$ 51,585</u>	<u>\$ 55,505</u>
3. Total [1c. + 2e.]	\$ 6,123,548	\$ 5,551,622		\$ 720,309	\$ 775,053

**APPENDIX C – SUMMARY OF ACTUARIAL ASSUMPTIONS AND METHODS**

**Data Assumptions and Practices**

In preparing our data, we relied on information supplied by the City of Philadelphia Municipal Retirement System staff. The data was reviewed to ensure that it complies with generally accepted actuarial standards. This information includes, but is not limited to, plan provisions, employee data, and financial information. Our methodology for obtaining the data used for the valuation is based upon the following assumptions and practices:

- We exclude raw active records with dates of hire after the valuation date.
- We include terminated vested records in the valuation data, regardless of whether they have enough service for vesting.
- We exclude terminated vested and retired records with values of zero in the benefit field.
- If a participant is found in multiple data files (e.g., both the active and retired data files), based on a match of both employee number and Social Security Number, we first attempt to identify the record with the most recent status change and keep only that record. If it is not apparent which record is the most recent, we keep the record that generates the highest liability in our valuation system.
- If a participant is found multiple times in the same data file, based on a match of both employee number and Social Security Number, we keep the record that generates the highest liability in our valuation system, except where one of the records is in the recorded death file in which case we check for a survivor record or delete the record.
- Valuation pay reflects a load of 6% of pay for Police (stress pay) and Firefighters (premium pay).
- The date of retirement for a terminated vested participant was set to the valuation date, if the given date was earlier.
- If the payment form field for pensioners is missing, we assume that 1967 Plan members receive a 50% J&S annuity with a return of contributions in excess of payments received upon death of the member, and we assume that Plan 87 members receive a life annuity, also with a return of contributions. However, if the pensioner is a beneficiary or survivor, we assume that they receive a life annuity only.
- For pensioners under the form of payment 50% J&S annuity with return of contributions, 50% are assumed to be married based upon data provided by the City. All other forms of payment are explicitly valued.
- Records with missing dates of birth have their data filled in based on the average for their plan.
- We assumed that all changes in participant data from last year to this year were valid unless indicated otherwise by System staff.
- We use the dates of hire and service credit provided in the data to calculate actuarial liability. We understand from the System staff that the service credit data provided does not include adjustments for breaks in service so to the extent that some members may have had breaks in service the actuarial liability is overstated.

**CITY OF PHILADELPHIA MUNICIPAL RETIREMENT SYSTEM  
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**APPENDIX C – SUMMARY OF ACTUARIAL ASSUMPTIONS AND METHODS**

- DROP participants are assumed to begin payments immediately.
- For Municipal Plan 1967 participants, pay was assumed to be below the Social Security Taxable Wage Base for purposes of determining the aggregate member contribution amount.
- We assumed that any participant who was active last year, missing this year is now a terminated non-vested participant.
- We assumed that any participant who was inactive last year and missing from this year without a clear reason is now deceased.

**CITY OF PHILADELPHIA MUNICIPAL RETIREMENT SYSTEM  
JULY 1, 2018 ACTUARIAL VALUATION**

**APPENDIX C – SUMMARY OF ACTUARIAL ASSUMPTIONS AND METHODS**

**A. Actuarial Assumptions**

**1. Investment Return Assumption**

7.60% compounded annually, net of expenses.

**2. Salary Increase Rate**

<b>Age</b>	<b>Municipal and Elected Officials</b>	<b>Uniformed</b>
<20	20.00%	20.00%
20	18.00%	11.00%
25	10.00%	7.00%
30	7.00%	5.00%
35	5.75%	4.25%
40	5.00%	4.00%
45	4.60%	3.50%
50	4.35%	3.30%
55	4.10%	3.00%
60	3.85%	3.00%
65+	3.50%	2.75%

**3. Total Annual Payroll Growth**

3.30% per year.

**4. Administrative Expenses**

Annual expected expenses included in this report are \$9,733,963 and assumed to increase by 3.30% per year. This amount is included in the normal cost as an explicit assumption for purposes of determining the contribution amounts.

**5. Funding of the Pension Adjustment Fund**

To recognize the expense of the benefits payable under the Pension Adjustment Fund, the actuarial liabilities have been increased by 0.54%. This estimate is based on the statistical average expected value of the benefits.

**CITY OF PHILADELPHIA MUNICIPAL RETIREMENT SYSTEM  
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**APPENDIX C – SUMMARY OF ACTUARIAL ASSUMPTIONS AND METHODS**

**6. Rates of Termination**

Termination rates are based on Division and age, sample rates shown below.

Age	Municipal and Elected Officials		Uniformed
20	0.2200		0.0350
25	0.1500		0.0310
30	0.1000		0.0235
35	0.0775		0.0160
40	0.0650		0.0100
45	0.0525		0.0100
50	0.0450		0.0100
55	0.0450		0.0000
60	0.0900		0.0000

We assume that a vested employee who terminates will elect a pension deferred to service retirement age as long as their age plus years of service at termination are greater than or equal to 55 (45 for police and fire employees in the 1967 Plan). Otherwise, we assume they elect a refund of member contributions.

**7. Rates of Disability**

Disability rates are based on Division and age and split between gender for Municipal and Elected Officials, sample rates shown below.

Age	Municipal and Elected Officials		Uniformed
	Male	Female	
20	0.000025	0.000025	0.000025
25	0.000050	0.000025	0.000500
30	0.000750	0.000400	0.001800
35	0.001000	0.000800	0.004000
40	0.001500	0.001300	0.005000
45	0.001900	0.002800	0.005200
50	0.004000	0.005700	0.004000
55	0.005400	0.005500	0.003000
60	0.000000	0.000000	0.000000

\*For municipal and elected members, we assume that 65% of all disabilities are ordinary and 35% are service-connected. For police and fire members, we assume that 25% are ordinary and 75% are service-connected.

**CITY OF PHILADELPHIA MUNICIPAL RETIREMENT SYSTEM  
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**APPENDIX C – SUMMARY OF ACTUARIAL ASSUMPTIONS AND METHODS**

**8. Rates of Pre-Retirement Mortality**

Municipal and Elected Officials: 110% and 115%, for males and females, respectively, of the RP-2014 Employee Table projected from base year of 2006 to 2021 using mortality improvement scale MP-2017.

Uniformed: 85% of the RP-2014 Blue Collar Employee Table projected from base year of 2006 to 2021 using mortality improvement scale MP-2017.

Experience studies are performed every four years as required by State law which requires regular and detailed experience and analysis of the mortality trends such that improvements are addressed incrementally with assumption changes as a result of these studies. This mandatory process allows for periodic recognition of mortality improvements which are sufficient in addressing the potential trend. The most recent experience study was conducted for the period between July 1, 2012 and June 30, 2017.

Age	Municipal and Elected Officials		Uniformed	
	Male	Female	Male	Female
20	0.000409	0.000189	0.000408	0.000157
25	0.000530	0.000212	0.000530	0.000176
30	0.000550	0.000268	0.000550	0.000221
35	0.000668	0.000380	0.000668	0.000315
40	0.000772	0.000524	0.000772	0.000434
45	0.001086	0.000769	0.001086	0.000638
50	0.001802	0.001226	0.001802	0.001016
55	0.003018	0.002002	0.003018	0.001660
60	0.005319	0.003088	0.005319	0.002560
65	0.009579	0.004453	0.009578	0.003691

\* For municipal and elected members, we assume that 98.5% of all deaths are ordinary, with 1.5% service-connected. For police and fire members, 92% are assumed to be ordinary and 8% service-connected.

**CITY OF PHILADELPHIA MUNICIPAL RETIREMENT SYSTEM  
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**APPENDIX C – SUMMARY OF ACTUARIAL ASSUMPTIONS AND METHODS**

**9. Rates of Post-Retirement Mortality**

Municipal and Elected Officials: 127% and 119% for males and females, respectively, of the RP-2014 Healthy Annuitant Table projected from base year 2006 to 2021 using mortality improvement scale MP-2017.

Uniformed: 115% of the RP-2014 Blue Collar Healthy Annuitant Table projected from base year of 2006 to 2021 using mortality improvement scale MP-2017.

Age	Municipal and Elected Officials		Uniformed	
	Male	Female	Male	Female
50	0.005015	0.003186	0.004541	0.003139
55	0.007168	0.004486	0.006789	0.004817
60	0.010180	0.006792	0.010031	0.007252
65	0.014715	0.010033	0.015263	0.010512
70	0.021742	0.015288	0.023114	0.016035
75	0.034319	0.024900	0.036499	0.026399
80	0.057729	0.042731	0.060617	0.045229
85	0.101295	0.076712	0.102771	0.079656
90	0.178648	0.137255	0.174268	0.138509
95	0.278849	0.224212	0.261914	0.219761

**10. Rates of Post-Disability Mortality**

Municipal and Elected Officials: 95% of the RP-2014 Disabled Retiree Table projected from base year 2006 to 2021 using mortality improvement scale MP-2017.

Uniformed: 80% of the RP-2014 Disabled Retiree Table projected from base year 2006 to 2021 using mortality improvement scale MP-2017.

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**APPENDIX C – SUMMARY OF ACTUARIAL ASSUMPTIONS AND METHODS**

<b>Age</b>	<b>Municipal and Elected Officials</b>		<b>Uniformed</b>	
	<b>Male</b>	<b>Female</b>	<b>Male</b>	<b>Female</b>
35	0.010106	0.004319	0.008510	0.003637
40	0.011676	0.005959	0.009832	0.005018
45	0.016427	0.008752	0.013834	0.007370
50	0.018826	0.010942	0.015854	0.009214
55	0.021849	0.014315	0.018399	0.012055
60	0.026070	0.017756	0.021954	0.014953
65	0.031668	0.020761	0.026668	0.017483
70	0.039130	0.026749	0.032952	0.022526
75	0.051951	0.038967	0.043748	0.032814
80	0.073980	0.059755	0.062299	0.050320

**11. Rates of Retirement**

<b>Rates of Service Retirement - 1967 Plan</b>		
<b>Age</b>	<b>Municipal</b>	<b>Uniformed</b>
45	0.00	0.10
46-52	0.00	0.05
53-54	0.00	0.10
55	0.30	0.15
56	0.20	0.17
57	0.30	0.20
58	0.30	0.20
59	0.20	0.20
60	0.20	0.25
61	0.20	0.30
62	0.25	0.30
63	0.20	0.30
64	0.20	0.30
65	0.30	0.30
66	0.20	0.30
67	0.20	0.30
68	0.20	0.30
69	0.30	0.30
70+	1.00	1.00

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**APPENDIX C – SUMMARY OF ACTUARIAL ASSUMPTIONS AND METHODS**

Rates of Service Retirement - 1987 Plan and Plan '10				
Age	Municipal and Elected Officials		Uniformed	
	First Year Eligible	Subsequent Years	First Year Eligible	Subsequent Years
45	0.000	0.000	0.030	0.000
46-49	0.000	0.000	0.030	0.030
50	0.000	0.000	0.060	0.060
51	0.000	0.000	0.100	0.050
52	0.050	0.020	0.100	0.050
53-54	0.100	0.020	0.100	0.050
55	0.100	0.020	0.100	0.070
56	0.100	0.020	0.100	0.100
57	0.100	0.020	0.100	0.070
58	0.100	0.020	0.100	0.120
59	0.100	0.080	0.100	0.120
60	0.250	0.250	0.100	0.120
61	0.150	0.200	0.100	0.120
62	0.400	0.250	0.100	0.300
63	0.250	0.200	0.100	0.300
64	0.300	0.200	0.100	0.300
65-69	0.600	0.200	0.100	0.500
70	0.100	1.000	0.100	1.000

Retirements under DROP are included in the rates above.

**12. Family Composition Assumptions**

70% of active members and 50% of non-active members are assumed to be married for retirees with the 50% J&S with return on contribution form of payment only. Male spouses are assumed to be four-years older than female spouses.

**13. Service-connected disability benefit**

Service-connected disability benefits are increased by 2.9% to account for the periodic adjustment.

**CITY OF PHILADELPHIA MUNICIPAL RETIREMENT SYSTEM  
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**APPENDIX C – SUMMARY OF ACTUARIAL ASSUMPTIONS AND METHODS**

**14. Rationale for Assumptions**

The assumptions used in this report reflect the results of an Experience Study performed by Cheiron covering the five year period from July 1, 2012 through June 30, 2017 and adopted by the Board. More details on the rationale for the demographic and economic assumptions can be found in the Experience Study Report dated March 28, 2018.

**15. Changes Since Last Valuation**

- Demographic assumptions (mortality rates, retirement rates, termination rates, disability rates, service-connected disability rates, and marriage assumption for non-active members) and economic assumptions (salary increases) were updated to reflect the most recent experience study.
- The interest rate assumption was decreased from 7.65% to 7.60%.
- The administrative expenses assumption was changed from \$9,166,488 to \$9,733,963 to better reflect actual experience.

APPENDIX C – SUMMARY OF ACTUARIAL ASSUMPTIONS AND METHODS

**B. Actuarial Methods**

**1. Actuarial Funding Method**

The Entry Age Normal actuarial funding method was used for active employees, whereby the normal cost is computed as the level annual percentage of pay required to fund the retirement benefits between each member's date of hire and assumed retirement. The actuarial liability is the difference between the present value of future benefits and the present value of future normal cost. The unfunded actuarial liability is the difference between the actuarial liability and the actuarial value of assets.

**2. Funding Methods**

*City's Funding Policy:*

The initial July 1, 1985 UAL is amortized over 34 years ending June 30, 2019, with payments increasing at 3.3% per year, the assumed payroll growth. Other changes in the actuarial liability are amortized in level-dollar payments as follows:

- Actuarial gains and losses – 20 years beginning July 1, 2009. Prior to July 1, 2009, gains and losses were amortized over 15 years
- Assumption changes – 15 years beginning July 1, 2010. Prior to July 1, 2010, assumption changes were amortized over 20 years
- Plan changes for active members – 10 years
- Plan changes for inactive members – 1 year
- Plan changes mandated by the State – 20 years

Tiered and additional Police Officer and Firefighter member contributions offset the City's portion of the normal cost.

*MMO:*

For the purposes of the MMO under Act 205 reflecting the fresh start amortization schedule, the July 1, 2009 UAL was "fresh started" to be amortized over 30 years ending June 30, 2039. This is a level dollar amortization of the UAL. All future amortization periods will follow the City's Funding Policy as outlined above.

Tier and additional Police Officer and Firefighter member contributions offset the City's portion of the normal cost in accordance with Act 205. Sales tax revenue is contributed in addition to the MMO resulting in gains under the funding method.

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**APPENDIX C – SUMMARY OF ACTUARIAL ASSUMPTIONS AND METHODS**

*Revenue Recognition Policy:*

This calculation is similar to the MMO except that the assets used to determine the unfunded liability do not include the accumulated value of sales tax revenue and tier and additional Police and Fire member contributions received by the System. These sources of income are contributed over and above the City's contribution of the MMO and will be in addition to the MMO. Therefore under this funding method, the additional revenue amounts are separately tracked and accumulated in a notional account which is then subtracted from the assets before calculating the contribution amounts due under the Minimum Municipal Obligation (MMO) methodology. We accumulate these amounts in a notional account and deduct them from the Actuarial Asset Value before the MMO is determined. These amounts are accumulated at the Actuarial Asset Value return rates to preserve the funding methodology objective.

Tier and additional Police Officer and Firefighter member contributions do not offset the City's portion of the normal cost.

**3. Asset Valuation Method**

The actuarial value of assets (AVA) is determined using an adjusted market value. Under this method, a preliminary AVA is determined as the market value of assets on the valuation date, minus the existing balance of the Pension Adjustment Fund (PAF) rolled forward at the current year's market rate of return, minus a decreasing fraction (9/10, 8/10, 7/10, etc.) of the investment gains or losses in each of the preceding nine years. Gains and losses prior to FYE June 30, 2008 were smoothed over a five-year period and have now all been fully recognized. The gain or loss for a given year is the difference between the actual investment return (on a market-to-market basis) and the assumed investment return based on the market value of assets at the beginning of the year and actual cash flow. The AVA is adjusted, if necessary, to remain between 80% and 120% of the market value net of the PAF. The final AVA is determined by subtracting the additional transfer amount (if any) to the PAF. The additional transfer amount to the PAF remains to be calculated based on the five-year smoothing method.

**4. Changes Since Last Valuation**

None

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**APPENDIX D – SUMMARY OF PLAN PROVISIONS – 1967 PLAN**

This summary of plan provisions provides an overview of the major provisions of the pension plans used in the actuarial valuation. It is not intended to replace the more precise language of the retirement code, and if there is any difference between the description of the plans herein and the actual text of the retirement code, the retirement code will govern.

**1. Participation**

*Municipal (Plan J):*

Full-time employees participate on their date of employment. Temporary employees participate after completing six months of employment. Participation is limited to employees hired before January 8, 1987. District Council 47 (Local 2186 or 2187) and 33 members hired between January 8, 1987 and October 1, 1992 were switched from Plan 87 to 1967 Plan effective on their hire dates, provided such employees contributed the difference between what they paid to the Plan and the amount they would have paid under Plan J.

*Uniformed (Plans D and X):*

Same as municipal.

**2. Credited Service**

*Municipal (Plan J):*

Credited service means the period of employment with the City during which the employee makes contributions to the Retirement System. Certain leaves of absence may also be credited.

*Uniformed (Plans D and X):*

Same as municipal.

**3. Total Compensation**

*Municipal (Plan J):*

Total compensation means the base rate of pay, longevity payments, and overtime received during a 12-month period.

*Uniformed (Plans D and X):*

Total compensation means the base rate of pay, longevity payments, and stress or premium pay (up to 6% of base pay) received during a 12-month period.

**4. Final Compensation**

*Municipal (Plan J):*

Final compensation means whichever is greater: annual base rate of pay at the time of termination or the total compensation received during the 12 months immediately preceding termination, including supplementary compensation received under Civil Service Regulation No. 32.

*Uniformed (Plans D and X):*

Same as municipal.

**APPENDIX D – SUMMARY OF PLAN PROVISIONS – 1967 PLAN**

**5. Average Final Compensation**

*Municipal (Plan J):*

Average final compensation means the arithmetic average of the total compensation received during the three calendar or anniversary years that produce the highest average.

*Uniformed (Plans D and X):*

Average final compensation means the highest of:

- The total compensation received during the 12-month period; or
- The annual base rate of pay, excluding longevity payments, calculated from the final pay period; or
- The arithmetic average of the total compensation received during five calendar years of employment.

**6. Employee Contributions**

*Municipal (Plan J):*

Employees who participate in the Social Security System contribute 3¾% of total compensation up to the taxable wage base (\$127,200 in 2017, and \$128,400 in 2018) and 6% of total compensation above the taxable wage base to the Retirement System.

Each employee who does not participate in the Social Security System contributes 6% of his total compensation to the Retirement System.

All employees pay an additional 0.5% of compensation for the period between January 1, 2015 through December 31, 2015, and 1.0% of compensation January 1, 2016 onwards.

Effective January 1, 2019 current employees with annual salary (excluding overtime) in excess of \$45,000 will pay additional tier contributions on their total compensation over their base rates as follows: +0.50% for annual salary between \$45,000-\$55,000; +1.50% for annual salary between \$55,000-\$75,000; +2.00% for annual salary between \$75,000-\$100,000; and +2.75% for annual salary greater than 100,000.

*Uniformed (Plans D and X):*

6% of total compensation to the Retirement System.

**7. Service Retirement**

**Eligibility**

*Municipal (Plan J):*

Each municipal employee is eligible to retire and receive a service pension at age 55 with one year of service.

*Uniformed (Plans D and X):*

Each uniformed employee is eligible to retire and receive a service pension at age 45.

CITY OF PHILADELPHIA MUNICIPAL RETIREMENT SYSTEM  
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**APPENDIX D – SUMMARY OF PLAN PROVISIONS – 1967 PLAN**

**Benefit Amount**

*Municipal (Plan J):*

The service pension equals 2 1/2% of the employee's average final compensation multiplied by credited service to a maximum of 20 years plus 2% of the employee's average final compensation multiplied by credited service above 20, to a maximum of 80% of the employee's average final compensation.

*Uniformed (Plans D and X):*

The service pension equals 2 1/2% of the employee's average final compensation multiplied by credited service, subject to a maximum of 100% of average final compensation. A minimum of \$1,000 per month is provided for those who retired with 20 or more years of service.

**8. Early Retirement**

**Eligibility**

*Municipal (Plan J):*

Each municipal employee is eligible to retire and receive a reduced service pension at age 52 if he has 10 or more years of credited service.

*Uniformed (Plans D and X):*

Each uniformed employee is eligible to retire and receive a reduced service pension at age 40 if he or she has 10 or more years of credited service.

**Benefit Amount**

*Municipal (Plan J):*

The annual amount is calculated the same as service retirement, reduced by 1/2 of 1% for each month the employee is younger than minimum retirement age.

*Uniformed (Plans D and X):*

Same as municipal.

**9. Deferred Vested Retirement**

**Eligibility**

*Municipal (Plan J):*

A terminating employee who has completed 10 or more years of credited service is eligible for a deferred vested retirement benefit.

*Uniformed (Plans D and X):*

Same as municipal.

**APPENDIX D – SUMMARY OF PLAN PROVISIONS – 1967 PLAN**

**Benefit Amount**

*Municipal (Plan J):*

The annual deferred vested benefit is determined the same as service pensions, using average final compensation and credited service at termination. This benefit begins at service retirement date. If the member dies before the deferred vested benefit begins, an ordinary death benefit is payable (see Ordinary Death below). As an alternative before benefits begin, a plan member who is terminating employment may ask to have employee contributions returned (without interest) instead of receiving the deferred vested benefit.

*Uniformed (Plans D and X):*

Same as municipal.

**10. Withdrawal Benefit**

*Municipal (Plan J):*

Each employee terminating who has completed less than 10 years of credited service will receive a withdrawal benefit equal to his or her employee contributions (without interest).

*Uniformed (Plans D and X):*

Same as municipal.

**11. Service-Connected Death**

**Eligibility**

*Municipal (Plan J):*

The beneficiary of each active employee who dies solely from the performance of duties of the employee's position with the City is eligible for an immediate death benefit.

*Uniformed (Plans D and X):*

Same as municipal.

**Benefit Amount**

*Municipal (Plan J):*

The death benefit equals total employee contributions paid to the Retirement System, plus a yearly payment of 60% of the employee's final compensation reduced by any death benefits payable under the Worker's Compensation Act.

This benefit is payable to the spouse until his or her death. Dependent children are entitled to an additional yearly payment of 10% of final compensation for each dependent child (up to two children) until the child reaches age 18. If there is no spouse, or if the spouse dies or remarries, each dependent child (up to three children) is entitled to receive a yearly payment of 25% of final compensation until the child reaches age 18.

**APPENDIX D – SUMMARY OF PLAN PROVISIONS – 1967 PLAN**

If there are no spouse or dependent children, each dependent parent is entitled to receive a yearly payment of 15% of final compensation for life.

*Uniformed (Plans D and X):*  
Same as municipal.

**12. Ordinary Death**

**Eligibility**

*Municipal (Plan J):*

The beneficiary of an active employee (or a terminated vested employee who did not withdraw employee contributions) who dies after completing 10 years of credited service or reaches age 55 is eligible for an immediate death benefit equal to a yearly pension or a lump sum payment. The beneficiary of an active employee who dies before completing 10 years of credited service and reaches age 55 is eligible for a lump sum payment.

The beneficiary may be any relative by blood or marriage.

*Uniformed (Plans D and X):*

The beneficiary of any employee who dies while actively employed (or a terminated vested employee who did not withdraw employee contributions) is eligible for a death benefit equal to a yearly pension or a lump sum payment.

The beneficiary may be any relative by blood or marriage.

**Annual Pension**

*Municipal (Plan J):*

The annual ordinary death pension, payable for life, is equal to the regular service pension the employee would have received if eligible to retire on the day before he died and had elected Option 2, joint and 100% contingent annuitant (see Survivor Benefits below).

*Uniformed (Plans D and X):*

The annual ordinary death pension, payable for life, is equal to the regular service pension the employee would have received (based on a minimum of 10 years of service) had the person been eligible to retire on the day before dying and had elected Option 2, joint and 100% contingent annuitant (see Survivor Benefits below).

**Lump Sum Payment**

*Municipal (Plan J):*

The lump sum payment is equal to 10% of the deceased employee's average final compensation multiplied by years of credited service to a maximum of 10, plus the deceased employee's contributions to the Retirement System, minus the total amount of the deceased employee's City paid life insurance.

*Uniformed (Plans D and X):*  
Same as municipal.

APPENDIX D – SUMMARY OF PLAN PROVISIONS – 1967 PLAN

**13. Service-Connected Disability**

**Eligibility**

*Municipal (Plan J):*

An active employee found by the Board of Pensions and Retirement to be mentally or physically permanently incapacitated (unable to perform duties) solely as the result of accident or injury during the performance of duties is eligible for an immediate service-connected disability pension.

*Uniformed (Plans D and X):*

Same as municipal. A minimum of \$1,000 per month is provided for Uniformed members.

**Benefit Amount**

*Municipal (Plan J):*

The service-connected disability benefit is equal to the Employee's Retirement System contributions, plus a yearly benefit of 70% of the employee's final compensation, reduced by any disability benefits payable under the Worker's Compensation Act. If he or she withdraws contributions, the benefit is payable for his or her lifetime only.

If the employee leaves employee contributions with the Retirement System, he or she may choose a survivor benefit option (see Survivor Benefit below) and the beneficiary will continue receiving benefit payments after his or her death.

*Uniformed (Plans D and X):*

Same as municipal.

**14. Service-Connected Disability Periodic Adjustment**

**Eligibility**

*Municipal (Plan J):*

An employee who is receiving a service-connected disability benefit who is totally disabled and does not collect Social Security disability insurance benefits is eligible for a periodic adjustment.

*Uniformed (Plans D and X):*

Same as municipal, but only applies to police employees.

**Benefit Amount**

*Municipal (Plan J):*

The disabled employee's pension will be increased in the eighth year after separation by the percentage raise given in the previous year to active employees in his or her job class. The adjustment will continue each year thereafter until the employee's 65th birthday.

*Uniformed (Plans D and X):*

Same as municipal.

**APPENDIX D – SUMMARY OF PLAN PROVISIONS – 1967 PLAN**

**15. Ordinary Disability**

**Eligibility**

*Municipal (Plan J):*

An active employee found by the Board to be mentally or physically permanently incapacitated from the further performance of duties due to an accident or illness not caused by the performance of duties is eligible for an immediate ordinary disability benefit after completing 10 years of credited service.

*Uniformed (Plans D and X):*

Same as municipal, except that fire employees only need five years of credited service and police employees have no service requirement if the disability is permanent and total. Police employees with permanent and partial disability need 10 years of credited service.

**Benefit Amount**

*Municipal (Plan J):*

The annual ordinary disability benefit is equal to the benefit determined under the service pension formula using average final compensation and credited service as of the date of disablement. If the employee is eligible for or receiving workers' compensation, no benefit is payable. Such employee may apply for benefits at retirement age.

*Uniformed (Plans D and X):*

Same as municipal, except police employees that have no service requirement are credited with a minimum of 10 years of credited service. Same as municipal.

**16. Survivor Benefit**

*Municipal (Plan J):*

Service pensions, deferred vested benefits, service-connected disability benefits (if employee contributions are left on deposit), and ordinary disability benefits are payable under five optional forms. Options 1, 2, 3, and 5 provide benefits actuarially equivalent to a lifetime only pension while Option 4 has no reduction.

Option 1 – A benefit is payable to the employee with the provision that upon death, the beneficiary will receive a lump sum equal to the excess, if any, of the employee's contributions over the sum of the payments received.

Option 2 – A reduced benefit payable to the employee with the provision that 100% of the reduced benefit will be paid to the designated beneficiary for life after the death of the employee.

Option 3 – Same as Option 2 except only 50% of the reduced benefit is continued to the designated beneficiary.

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**APPENDIX D – SUMMARY OF PLAN PROVISIONS – 1967 PLAN**

Option 4 – Upon the employee’s death, 50% of the benefit will continue to be paid to the surviving spouse for life, provided the employee and spouse were married for two years before retirement and at death. If there is no eligible spouse at the time the employee dies, or the spouse dies before the full amount of the contributions have been returned, 50% of the benefit is continued to dependent children until age 18, or if no dependent children, payments are given to dependent parents for the remainder of their lives. In addition, Option 4 provides for a guaranteed return of employee contributions as described in Option 1 above.

Option 5 – Provides for a partial lump sum of between 6 and 36 monthly payments payable under Options 1, 2, 3 or 4. The remaining monthly benefit is reduced so that the partial lump sum plus the reduced benefit is actuarially equivalent to the original benefit.

*Uniformed (Plans D and X):*  
Same as municipal.

**17. Minimum Pension**

*Municipal (Plan J):*

The monthly minimum pension to a pensioner is equal to \$25 multiplied by the pensioner’s completed years of credited service, to a 10-year maximum.

*Uniformed (Plans D and X):*

The monthly minimum pension to pensioners is \$500. The monthly minimum pension to all other pensioners is \$440 providing such pension will increase to \$500 at the time the pensioner reaches age 60.

**18. Waiver of Benefit**

*Municipal (Plan J):*

Any employee at service retirement age with less than three but more than one year of credited service may waive the right to receive a monthly benefit and in lieu thereof, receive a lump sum payment of twice his or her employee contributions without interest.

*Uniformed (Plans D and X):*  
Same as municipal.

**19. Service-Connected Health Care Benefit**

*Municipal (Plan J):*  
Not applicable.

*Uniformed (Plans D and X):*

If a uniformed employee dies during the performance of duties, a service-connected health care benefit may be payable to the surviving spouse and dependent children. Regular payments will be made of the appropriate cost of maintaining medical, dental, optical, and prescription drug benefits that were in force at the time of the employee’s death. Payments to the spouse cease upon remarriage and to the dependent children at age 18 (age 22 if a full-time student) or, if dependent due to physical or mental infirmity, the duration of the infirmity. The health care benefits are not paid from the pension trust assets.

**APPENDIX D – SUMMARY OF PLAN PROVISIONS – 1967 PLAN**

**20. Deferred Retirement Option Plan (DROP)**

*Municipal (Plan J):*

Employees that have ten years of service and have reached two years past the minimum retirement age may elect to participate in the DROP. During this time, their accrued benefit will go into a DROP account and will earn interest at a specified rate. The rate is calculated each year on January 1 and is equal to the lesser of the yield on 1-year treasury bonds and half of the valuation interest rate as of that date. The benefit is calculated as of the date they entered the DROP. At the end of the DROP, the employees' accrued monthly benefit will commence, plus they will receive the accumulated amount of the accrued benefit paid to the DROP, as well as the interest earned on such benefit.

*Uniformed (Plans D and X):*

Same as municipal except that employees are eligible as soon as they have ten years of service and have reached minimum retirement age.

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**APPENDIX D – SUMMARY OF PLAN PROVISIONS – 1987 PLAN**

**1. Participation**

*Municipal (Plan Y):*

Full-time employees participate on their date of employment. Temporary employees participate after completing six months of employment. Participation is limited to employees hired on or after January 8, 1987. Any member of the 1967 Plan may irrevocably elect to participate in Plan 87. All employees hired after their Plan ‘10 effective date become members of Plan ‘10 with some groups having the option to elect into Plan 87. Employees first hired or rehired after their Plan 16 effective date become members of Plan 16.

*Uniformed (Plans A and B):*

Same as municipal except Police employees hired after January 1, 2010 and Fire employees hired on or after October 15, 2010 must make an election to participate in Plan 87.

*Elected (Plan L):*

Any City employee on or after January 8, 1987, in any general, municipal, or special election, participates in this Plan. Effective November 11, 2014, elected officials become members of Plan ‘10 upon employment or taking office unless they elect to participate in Plan 87.

**2. Credited Service**

*Municipal (Plan Y):*

Credited service means the period of employment with the City during which the employee makes contributions to the Retirement System. Certain leaves of absence may also be credited.

*Uniformed (Plans A and B):*

Same as municipal.

*Elected (Plan L):*

Same as municipal.

**3. Total Compensation**

*Municipal (Plan Y):*

Total compensation means the base rate of pay, overtime, and longevity payments received during a 12-month period.

*Uniformed (Plans A and B):*

Total compensation means the base rate of pay, longevity payments, and stress or premium pay (up to 6% of base pay) received during a 12-month period.

**APPENDIX D – SUMMARY OF PLAN PROVISIONS – 1987 PLAN**

*Elected (Plan L):*

Total compensation means the base rate of pay and longevity payments received during a 12-month period.

**4. Final Compensation**

*Municipal (Plan Y):*

Final compensation means whichever is greater: annual base rate of pay at the time of termination or the total compensation received during the 12 months immediately preceding termination, including supplementary compensation received under Civil Service Regulation No. 32.

*Uniformed (Plans A and B):*

Same as municipal.

*Elected (Plan L):*

Same as municipal.

**5. Average Final Compensation**

*Municipal (Plan Y):*

Average final compensation means the arithmetic average of the total compensation received during the three calendar or anniversary years producing the highest average.

*Uniformed (Plans A and B):*

Average final compensation means the arithmetic average of the total compensation received during the two calendar or anniversary years producing the highest average.

*Elected (Plan L):*

Same as municipal.

**6. Employee Contributions**

*Municipal (Plan Y):*

Total employee contributions equal 30% of the gross normal cost for all members in the municipal division. For employees of the Sheriff's Office represented by Lodge 5 of the F.O.P hired after January 1, 2012 and prior to August 20, 2018, who elect to participate in Plan Y employee contributions equal 50% of gross normal cost. Exempt and non-represented employees hired after January 13, 1999 and prior to January 1, 2019 (and current employees as of January 13, 1999 that elect to do so) will contribute an additional amount to become vested in five years. Employees hired after their Plan '10 date who elect the option to participate in Plan 87 prime will pay an additional 1.0% of compensation.

All employees will pay an additional 0.5% of compensation for the period between January 1, 2015 through December 31, 2015 and 1.0% of compensation January 1, 2016 onwards.

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**APPENDIX D – SUMMARY OF PLAN PROVISIONS – 1987 PLAN**

Effective January 1, 2019 current employees with annual salary (excluding overtime) in excess of \$45,000 will pay additional tier contributions on their total compensation over their base rates as follows: +0.50% for annual salary between \$45,000-\$55,000; +1.50% for annual salary between \$55,000-\$75,000; +2.00% for annual salary between \$75,000-\$100,000; and +2.75% for annual salary greater than 100,000.

*Uniformed (Plans A and B):*

Total employee contributions equal 5% of total compensation, but not less than 30% or greater than 50% of gross normal cost for members in the uniformed division. Police employees hired after January 1, 2010 and Fire Fighters hired after October 15, 2010, who elect to participate in the 1987 Plan, will contribute 6% of total compensation.

Member contributions for current employees are increased by 0.92% effective July 1, 2017 and an additional 0.92% effective July 1, 2018. For new employees hired or rehired on or after July 1, 2017 member contribution rate shall be increased by 2.5% over the current rate of 6%.

*Elected (Plan L):*

Total employee contributions equal 30% of the gross normal cost for all members in the elected division calculated under the Municipal Plan plus 100% of the gross normal cost that exceeds the cost for the municipal plan. Employees hired after January 13, 1999 (and current employees as of January 13, 1999 that elect to do so) will contribute an additional amount to become vested in the lesser of two-full terms or eight years. Elected officials that are elected into Office after November 14, 2014 pay an additional 1% of compensation to participate in Plan L instead of Plan '10. All employees will also pay an additional 0.5% of compensation for the period between January 1, 2015 through December 31, 2015 and 1.0% of compensation January 1, 2016 onwards.

Effective January 1, 2019 current and future employees with annual salary (excluding overtime) in excess of \$45,000 will pay additional tier contributions on their total compensation over their base rates as follows: +0.50% for annual salary between \$45,000-\$55,000; +1.50% for annual salary between \$55,000-\$75,000; +2.00% for annual salary between \$75,000-\$100,000; and +2.75% for annual salary greater than 100,000.

## **7. Service Retirement**

### **Eligibility**

*Municipal (Plan Y):*

Each municipal employee is eligible to retire and receive a service pension at age 60 if he or she has 10 or more years of credited service or, if the employee made additional contributions to become vested in five years, five years of credited service.

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**APPENDIX D – SUMMARY OF PLAN PROVISIONS – 1987 PLAN**

*Uniformed (Plans A and B):*

Each uniformed employee is eligible to retire and receive a service pension upon reaching age 50 and 10 or more years of credited service, or, if the employee made additional contributions to become vested in five years, five years of credited service.

*Elected (Plan L):*

Each elected official is eligible to retire and receive a service pension at age 55 if he or she has 10 or more years of credited service, or, if the employee made additional contributions to become vested in the lesser of two full terms or eight years, the lesser of two full terms or eight years of credited service.

**Benefit Amount**

*Municipal (Plan Y):*

The service pension equals 2.2% of the employee's average final compensation multiplied by years of credited service to a maximum of 10 years, plus 2% of the employee's average final compensation multiplied by years of service over 10, subject to a maximum of 100% of average final compensation.

*Uniformed (Plans A and B):*

The service pension equals 2.2% of the employee's average final compensation multiplied by years of credited service to a maximum of 20 years, plus 2% of the employee's average final compensation multiplied by years of credited service over 20, subject to a maximum of 100% of average final compensation.

*Elected (Plan L):*

The service pension equals 3.5% of the employee's average final compensation multiplied by years of credited service, subject to a maximum of 100% of average final compensation.

**8. Early Retirement**

**Eligibility**

*Municipal (Plan Y):*

Each municipal employee is eligible to retire and receive a reduced service pension at age 52 if he has 10 or more years of credited service. As an alternative, a member is eligible if he or she has at least 33 years of credited service, regardless of age.

*Uniformed (Plans A and B):*

Each uniformed employee is eligible to retire and receive a reduced service pension at age 40 if he or she has 10 or more years of credited service. Alternatively, a member is eligible if he has at least 25 years of credited service, regardless of age.

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**APPENDIX D – SUMMARY OF PLAN PROVISIONS – 1987 PLAN**

**Benefit Amount**

*Municipal (Plan Y):*

The annual amount is calculated the same as service retirement, reduced by 1/2 of 1% for each month the employee is younger than minimum retirement age. Benefits are not reduced if the employee has 33 or more years of credited service.

*Uniformed (Plans A and B):*

The annual amount is calculated the same as service retirement, reduced by 1/2 of 1% for each month the employee is younger than minimum retirement age. Benefits are not reduced if the employee has 25 or more years of credited service.

*Elected (Plan L):*

The annual amount is calculated the same as service retirement, reduced by 1/2 of 1% for each month the employee is younger than minimum retirement age.

**9. Deferred Vested Retirement**

**Eligibility**

*Municipal (Plan Y):*

An employee who terminates employment after completing 10 or more years of credited service or, if the employee made additional contributions to become vested in five years, five years of credited service, is eligible for a deferred vested retirement if his or her contributions have not been withdrawn.

*Uniformed (Plans A and B):*

Same as municipal.

*Elected (Plan L):*

A person terminating employment and who has completed 10 or more years of credited service, or if the employee made additional contributions to become vested in the lesser of two full terms or eight years, two full terms or eight years of credited service is eligible for a deferred vested retirement benefit provided he or she has not withdrawn contributions.

**Benefit**

*Municipal (Plan Y):*

The annual deferred vested benefit is determined the same as service pensions, based on average final compensation and credited service at termination. This benefit begins at the service retirement date. If a member dies before the deferred vested benefit begins, an ordinary death benefit is payable (see Ordinary Death below). As an alternative, the person terminating employment may request at any time before benefits begin a return of employee contributions (without interest) instead of the deferred vested benefit.

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**APPENDIX D – SUMMARY OF PLAN PROVISIONS – 1987 PLAN**

*Uniformed (Plans A and B):*  
Same as municipal.

*Elected (Plan L):*  
Same as municipal.

**10. Withdrawal Benefit**

**Eligibility**

*Municipal (Plan Y):*  
Each terminating employee who has completed fewer than 10 years of credited service (or, if the employee made additional contributions to become vested in five years, fewer than five years of credited service) will receive a withdrawal benefit equal to employee contributions (without interest).

*Uniformed (Plans A and B):*  
Same as municipal.

*Elected (Plan L):*  
Each terminating employee who completed fewer than 10 years of credited service will receive a withdrawal benefit equal to employee contributions (without interest).

**11. Service Connected Death**

**Eligibility**

*Municipal (Plan Y):*  
The beneficiary of each active employee who dies solely from the performance of duties of the employee's position with the City is eligible for an immediate death benefit.

*Uniformed (Plans A and B):*  
Same as municipal.

*Elected (Plan L):*  
Same as municipal.

**Benefit Amount**

*Municipal (Plan Y):*  
The death benefit equals the sum of the total employee contributions paid to the Retirement System (without interest), plus a yearly payment of 60% of the employee's final compensation reduced by any death benefits payable under the Workers' Compensation Act. This benefit is payable to the spouse until his or her death or remarriage, whichever occurs first. Dependent children are entitled to an additional 10% of final compensation yearly

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payment for each dependent child (up to two children) until the child reaches 18. This total benefit shall not exceed 80% of final compensation.

If there is no spouse, or if the spouse dies or remarries, each dependent child (up to three children) is eligible for a yearly payment of 25% of final compensation until the child reaches age 18. If there is no spouse or dependent children, each dependent parent is entitled to a 15% of final compensation yearly payment for life.

*Uniformed (Plans A and B):*

Same as municipal.

*Elected (Plan L):*

Same as municipal.

## **12. Ordinary Death**

### **Eligibility**

*Municipal (Plan Y):*

The beneficiary of an active employee (or a terminated vested employee who did not withdraw his employee contributions) who dies after completing 10 years of credited service (or five years of credited service if additional contributions were made) or who has reached age 60 is eligible for an immediate death benefit equal to an annual pension or a lump sum payment, whichever the beneficiary chooses.

The beneficiary of an active employee who dies before completing 10 years of credited service (or five years of credited service if additional contributions were made) or reaching age 60 is eligible for a lump sum payment.

The beneficiary may be any relative by blood or marriage.

*Uniformed (Plans A and B):*

The beneficiary of any employee who dies while actively employed (or a terminated vested employee who did not withdraw employee contributions) is eligible for a death benefit equal to an annual pension or a lump sum payment, whichever the beneficiary chooses.

The beneficiary may be any relative by blood or marriage.

*Elected (Plan L):*

The beneficiary of an active employee (or a terminated vested employee who did not withdraw contributions) who dies after completing 10 years of credited service or reaching age 55 is eligible for an immediate death benefit equal to an annual pension or a lump sum payment, whichever the beneficiary chooses.

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The beneficiary of an active employee who dies before completing 10 years of credited service or reaching age 55 is eligible for a lump sum payment. The beneficiary may be any relative by blood or marriage.

**Annual Pension**

*Municipal (Plan Y):*

The annual ordinary death pension, payable for life, is equal to the regular service pension the employee would have received had he or she been eligible to retire on the day before death and had elected Option 2, joint and 100% contingent annuitant (see Survivor Benefits below).

*Uniformed (Plans A and B):*

The annual ordinary death pension, payable for life, is equal to the regular service pension the employee would have received (based on a minimum of 10 years of service) had he been eligible to retire on the day before death and had elected Option 2, joint and 100% contingent annuitant (see Survivor Benefits below).

*Elected (Plan L):*

Same as municipal.

**Lump Sum Payment**

*Municipal (Plan Y):*

The lump sum payment is equal to the deceased employee's average final compensation multiplied by years of credited service (not to exceed the service in the denominator) and divided by the number of years of credited service needed to become vested, plus the deceased employee's contribution to the Retirement System (without interest) minus the total amount of the deceased employee's life insurance which was paid by the City.

*Uniformed (Plans A and B):*

Same as municipal.

*Elected (Plan L):*

Same as municipal.

**13. Service-Connected Disability**

**Eligibility**

*Municipal (Plan Y):*

An active employee found by the Board of Pensions and Retirement to be mentally or physically permanently incapacitated from any further performance of duties due solely to the result of the performance of duties is eligible for an immediate service-connected

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disability pension. The application for benefit must be made within one year after termination of employment.

*Uniformed (Plans A and B):*

Same as municipal.

*Elected (Plan L):*

An active employee found by the Board of Pensions and Retirement to be mentally or physically permanently incapacitated from any further performance of duties due solely to the result of the performance of duties is eligible for an immediate service-connected disability pension.

**Benefit Amount**

*Municipal (Plan Y):*

The service-connected disability benefit is equal to the employee's contributions to the Retirement System, plus a yearly benefit of 70% of the employee's final compensation, reduced by any disability benefits payable under the Worker's Compensation Act.

If he or she withdraws contributions, the benefit is payable for his or her lifetime only. If the employee leaves employee contributions with the Retirement System, he or she may choose a survivor benefit option (see Survivor benefit below) and the beneficiary will continue receiving benefit payments after his or her death.

*Uniformed (Plans A and B)*

Same as municipal.

*Elected (Plan L):*

Same as municipal.

**14. Service-Connected Disability Periodic Adjustment**

**Eligibility**

*Municipal (Plan Y):*

An employee who is receiving a service-connected disability benefit who is totally disabled and does not collect Social Security disability insurance benefits is eligible for a periodic adjustment.

*Uniformed (Plans A and B):*

Same as municipal, but only applies to police employees.

*Elected (Plan L):*

Same as municipal.

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**Benefit Amount**

*Municipal (Plan Y):*

The disabled employee's pension will be increased in the eighth year after separation by the percentage raise given in the previous year to active employees in his or her job class. The adjustment will continue each year until the employee's 65th birthday.

*Uniformed (Plans A and B):*

Same as municipal.

*Elected (Plan L):*

Same as municipal.

**15. Ordinary Disability**

**Eligibility**

*Municipal (Plan Y):*

An active employee found by the Board to be mentally or physically permanently incapacitated from the further performance of duties due to an accident or illness not caused by the performance of duties is eligible for an immediate ordinary disability benefit provided he or she has at least 10 years of credited service (or five years of credited service, if additional contributions were made). The application for benefits must be made within one year after termination.

*Uniformed (Plans A and B):*

Same as municipal, except that fire employees only need five years of credited service and police employees have no service requirement if the disability is permanent and total. Police employees with permanent and partial disability need 10 years of credited service (or five years of credited service, if additional contributions were made).

*Elected (Plan L):*

An active employee found by the Board to be mentally or physically permanently incapacitated from the further performance of duties due to an accident or illness not caused by the performance of duties is eligible for an immediate ordinary disability benefit provided he or she has completed at least 10 years of credited service, or eight years if additional contributions were made.

**Benefit Amount**

*Municipal (Plan Y):*

The annual ordinary disability benefit is equal to the benefit determined under the service pension formula using average final compensation and credited service as of the date of disablement.

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If the employee is eligible for or receiving workers compensation, no benefit is payable. Such employee may apply for benefits at retirement age.

*Uniformed (Plans A and B):*

Same as municipal, except each eligible employee is automatically credited with a minimum of 10 years of service to calculate the annual benefit.

*Elected (Plan L):*

The annual ordinary disability benefit is equal to the benefit determined under the service pension formula using average final compensation and credited service as of the date of disablement.

**16. Survivor Benefits**

*Municipal (Plan Y):*

Service pensions, deferred vested benefits, service-connected disability benefits, and ordinary disability benefits are payable under five optional forms. Options 2 and 3 provide benefits actuarially equivalent to a lifetime only pension while Option 1 has no reduction.

Option 1 - A benefit is payable to the employee providing on his death, the beneficiary will receive a lump sum equal to the excess, if any, of the employee's contributions over the sum of the payments received.

Option 2 - A reduced benefit payable to the employee with the provision that 100% of the reduced benefit will continue to be paid to the designated beneficiary for life after the death of the employee.

Option 3 - The same as Option 2 except only 50% of the reduced benefit is continued to the designated beneficiary.

Option 5 – Provides for a partial lump sum of between 6 and 36 monthly payments payable under Options 1, 2, 3 or 4. The remaining monthly benefit is reduced so that the partial lump sum plus the reduced benefit is actuarially equivalent to the original benefit.

*Uniformed (Plans A and B):*

Same as municipal, except that police and fire employees may also elect Option 4:

Option 4 - Upon the employee's death, 50% of the benefit will continue to be paid to the surviving spouse for life, provided the employee and spouse were married for two years before retirement and at death. If there is no eligible spouse at the time the employee dies, or the spouse dies before the full amount of the contributions have been returned, 50% of the benefit is continued to dependent children until age 18, or if no dependent children, payments are given to dependent parents for the remainder of their lives. In addition, Option 4 provides for a guaranteed return of employee contributions as described in Option 1 above.

*Elected (Plan L):*

Same as municipal.

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**17. Service-Connected Health Care Benefit**

**Eligibility**

*Municipal (Plan Y):*

Not applicable.

*Uniformed (Plans A and B):*

In the event of the death of a uniformed employee during the performance of his or her duties, a service-connected health care benefit may be payable to the surviving spouse and dependent children. Regular payments will be made of the appropriate cost of maintaining medical, dental, optical and pharmaceutical prescription benefits in force at the time of the employee's death. Payments to the spouse cease upon remarriage and to the dependent children at age 18 (age 22 if a full-time student) or if dependent due to physical or mental infirmity, the duration of the infirmity. The health care benefits are not paid from the pension trust assets.

*Elected (Plan L):*

Not applicable.

**18. Deferred Retirement Option Plan (DROP)**

**Eligibility**

*Municipal (Plan Y):*

Employees that have 10 years of service and have reached two years after the minimum retirement age may elect to participate in the DROP. During this time, their accrued benefit will go into a DROP account and will earn interest at a specified rate. The rate is calculated each year on January 1 and is equal to the lesser of the yield on 1-year treasury bonds and half of the valuation interest rate as of that date. The benefit is calculated as of the date they entered the DROP. At the end of the DROP, the employees' accrued monthly benefit will commence, plus they will receive the accumulated amount of the accrued benefit paid to the DROP, as well as the interest earned on such benefit.

*Uniformed (Plans A and B):*

Same as municipal except that employees are eligible as soon as they have ten years of service and have reached minimum retirement age.

*Elected (Plan L):*

Officials elected to Office after September 18, 2009 are not eligible to participate in the DROP.

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**1. Participation**

*Municipal:*

Municipal employees hired or rehired after the Plan ‘10 effective date (as shown below) become members in Plan ‘10 immediately upon employment. All Municipal employees except Elected Officials hired or rehired after their Plan 16 effective date become members of Plan 16.

Employees of the Sheriffs’ Office or Register of Wills: January 1, 2012

Employees represented by AFSCME, District Council 47: March 5, 2014

Municipal employees in the civil service not represented by a union: May 14, 2014

Employees represented by AFSCME, District Council 33, other than guards: September 2014

Guards represented by DC 33: November 11, 2014

Municipal employees not in the civil service and not represented by a union:  
November 11, 2014

Elected Officials: November 11, 2014

All employees except Register of wills and guards represented by DC 33 have the option within 30 days to elect to participate in Plan 87 Municipal.

*Uniformed:*

Police employees hired or rehired on or after January 1, 2010 and Fire employees hired or rehired on or after October 15, 2010 are members in Plan ‘10 immediately upon employment. Employees have the option within 30 days to elect to participate in Plans A or B.

Existing Plan A, Plan B, and Plan Y participants had the option, for a period of ninety (90) days, to make an irrevocable election to enter the Plan ‘10. Employees who elected do so would have their benefits in the existing pension plan frozen, and their future earnings and service will count only toward benefits under Plan ‘10.

**2. Credited Service**

*Municipal:*

Credited service means the period of employment with the City during which the employee makes contributions to the Retirement System. Certain leaves of absence may also be credited.

*Uniformed:*

Same as municipal.

**3. Total Compensation**

*Municipal:*

Total compensation means the base rate of pay, overtime, and longevity payments received during a 12-month period.

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*Uniformed:*

Total compensation means the base rate of pay, longevity payments, and stress or premium pay (up to 6% of base pay) received during a 12-month period.

**4. Final Compensation**

*Municipal:*

Final compensation means whichever is greater: annual base rate of pay at the time of termination or the total compensation received during the 12 months immediately preceding termination, including supplementary compensation received under Civil Service Regulation No. 32.

*Uniformed:*

Same as municipal.

**5. Average Final Compensation**

*Municipal:*

Average final compensation means the arithmetic average of the total compensation received during the five calendar or anniversary years producing the highest average.

*Uniformed:*

Same as municipal.

**6. Employee Contributions**

*Municipal:*

Total employee contributions equal 50% of the gross normal cost for members in the municipal division.

Effective January 1, 2019, current employees with annual salary (excluding overtime) in excess of \$45,000 will pay additional tier contributions on their total compensation over their base rates as follows: +0.50% for annual salary between \$45,000-\$55,000; +1.50% for annual salary between \$55,000-\$75,000; +2.00% for annual salary between \$75,000-\$100,000; and +2.75% for annual salary greater than 100,000.

*Uniformed:*

Total employee contributions equal 5.5% of total compensation up to twenty years of credited service.

Member contributions for current employees are increased by 0.92% effective July 1, 2017 and an additional 0.92% effective July 1, 2018. For new employees hired or rehired on or after July 1, 2017 employee contributions rate shall be increased by 2.5% over the current rate of 5.5%.

APPENDIX D – SUMMARY OF PLAN PROVISIONS – PLAN ‘10

7. Service Retirement

**Eligibility**

*Municipal:*

Each municipal employee is eligible to retire and receive a service pension at age 60 if he or she has 10 or more years of credited service.

*Uniformed:*

Each uniformed employee is eligible to retire and receive a service pension upon reaching age 50 and 10 or more years of credited service.

**Benefit Amount**

*Municipal:*

The service pension equals 1.25% of the employee’s average final compensation multiplied by years of credited service up to a maximum of 20 years.

*Uniformed:*

The service pension equals 1.75% of the employee’s average final compensation multiplied by years of credited service up to a maximum of 20 years.

8. Early Retirement

**Eligibility**

*Municipal:*

Each municipal employee is eligible to retire and receive a reduced service pension at age 52 if he has 10 or more years of credited service.

*Uniformed:*

Each uniformed employee is eligible to retire and receive a reduced service pension at age 40 if he or she has 10 or more years of credited service.

**Benefit Amount**

*Municipal:*

The annual amount is calculated the same as service retirement, reduced by 1/2 of 1% for each month the employee is younger than minimum retirement age.

*Uniformed:*

Same as municipal.

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**9. Deferred Vested Retirement**

**Eligibility**

*Municipal:*

An employee who terminates employment after completing 10 or more years of credited service is eligible for a deferred vested retirement if his or her contributions have not been withdrawn.

*Uniformed:*

Same as municipal.

**Benefit Amount**

*Municipal:*

The annual deferred vested benefit is determined the same as service pensions, based on average final compensation and credited service at termination. This benefit begins at the service retirement date. If a member dies before the deferred vested benefit begins, an ordinary death benefit is payable (see Ordinary Death below). As an alternative, the person terminating employment may request at any time before benefits begin a return of employee contributions (without interest) instead of the deferred vested benefit.

*Uniformed:*

Same as municipal.

**10. Withdrawal Benefit**

**Eligibility**

*Municipal:*

Each terminating employee who has completed fewer than 10 years of credited service will receive a withdrawal benefit equal to employee contributions (without interest).

*Uniformed:*

Same as municipal.

**11. Service Connected Death**

**Eligibility**

*Municipal:*

The beneficiary of each active employee who dies solely from the performance of duties of the employee's position with the City is eligible for an immediate death benefit.

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*Uniformed:*

Same as municipal.

**Benefit Amount**

*Municipal:*

The death benefit equals the sum of the total employee contributions paid to the Retirement System (without interest), plus a yearly payment of 60% of the employee’s final compensation reduced by any death benefits payable under the Workers’ Compensation Act. This benefit is payable to the spouse until his or her death or remarriage, whichever occurs first. Dependent children are entitled to an additional 10% of final compensation yearly payment for each dependent child (up to two children) until the child reaches 18. This total benefit shall not exceed 80% of final compensation.

If there is no spouse, or if the spouse dies or remarries, each dependent child (up to three children) is eligible for a yearly payment of 25% of final compensation until the child reaches age 18. If there is no spouse or dependent children, each dependent parent is entitled to a 15% of final compensation yearly payment for life.

*Uniformed:*

Same as municipal.

**12. Ordinary Death**

**Eligibility**

*Municipal:*

The beneficiary of an active employee (or a terminated vested employee who did not withdraw his employee contributions) who dies after completing 10 years of credited service or who has reached age 60 is eligible for an immediate death benefit equal to an annual pension or a lump sum payment, whichever the beneficiary chooses.

The beneficiary of an active employee who dies before completing 10 years of credited service or reaching age 60 is eligible for a lump sum payment.

The beneficiary may be any relative by blood or marriage.

*Uniformed:*

The beneficiary of any employee who dies while actively employed (or a terminated vested employee who did not withdraw employee contributions) is eligible for a death benefit equal to an annual pension or a lump sum payment, whichever the beneficiary chooses.

The beneficiary may be any relative by blood or marriage.

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**Annual Pension**

*Municipal:*

The annual ordinary death pension, payable for life, is equal to the regular service pension the employee would have received had he or she been eligible to retire on the day before death and had elected Option 2, joint and 100% contingent annuitant (see Survivor Benefits below).

*Uniformed:*

The annual ordinary death pension, payable for life, is equal to the regular service pension the employee would have received (based on a minimum of 10 years of service) had he been eligible to retire on the day before death and had elected Option 2, joint and 100% contingent annuitant (see Survivor Benefits below).

**Lump Sum Payment**

*Municipal:*

The lump sum payment is equal to the deceased employee’s average final compensation multiplied by years of credited service (not to exceed the service in the denominator) and divided by the number of years of credited service needed to become vested, plus the deceased employee’s contribution to the Retirement System (without interest) minus the total amount of the deceased employee’s life insurance which was paid by the City.

*Uniformed:*

Same as municipal.

**13. Service-Connected Disability**

**Eligibility**

*Municipal:*

An active employee found by the Board of Pensions and Retirement to be mentally or physically permanently incapacitated from any further performance of duties due solely to the result of the performance of duties is eligible for an immediate service-connected disability pension. The application for benefit must be made within one year after termination of employment.

*Uniformed:*

Same as municipal.

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**Benefit Amount**

*Municipal:*

The service-connected disability benefit is equal to the employee’s contributions to the Retirement System, plus a yearly benefit of 70% of the employee’s final compensation, reduced by any disability benefits payable under the Worker’s Compensation Act.

If he or she withdraws contributions, the benefit is payable for his or her lifetime only. If the employee leaves employee contributions with the Retirement System, he or she may choose a survivor benefit option (see Survivor benefit below) and the beneficiary will continue receiving benefit payments after his or her death.

*Uniformed:*

Same as municipal.

**14. Service-Connected Disability Periodic Adjustment**

**Eligibility**

*Municipal:*

An employee who is receiving a service-connected disability benefit who is totally disabled and does not collect Social Security disability insurance benefits is eligible for a periodic adjustment.

*Uniformed:*

Same as municipal, but only applies to police employees.

**Benefit Amount**

*Municipal:*

The disabled employee’s pension will be increased in the eighth year after separation by the percentage raise given in the previous year to active employees in his or her job class. The adjustment will continue each year until the employee’s 65th birthday.

*Uniformed:*

Same as municipal.

**15. Ordinary Disability**

**Eligibility**

*Municipal:*

An active employee found by the Board to be mentally or physically permanently incapacitated from the further performance of duties due to an accident or illness not caused by the performance of duties is eligible for an immediate ordinary disability benefit provided

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he or she has at least 10 years of credited service. The application for benefits must be made within one year after termination.

*Uniformed:*

Same as municipal, except that fire employees only need five years of credited service and police employees have no service requirement if the disability is permanent and total. Police employees with permanent and partial disability need 10 years of credited service.

**Benefit Amount**

*Municipal:*

The annual ordinary disability benefit is equal to the benefit determined under the service pension formula using average final compensation and credited service as of the date of disablement.

If the employee is eligible for or receiving workers compensation, no benefit is payable. Such employee may apply for benefits at retirement age.

*Uniformed (Plans A and B):*

Same as municipal, except each eligible employee is automatically credited with a minimum of 10 years of service to calculate the annual benefit.

**16. Survivor Benefits**

**Eligibility**

*Municipal:*

Service pensions, deferred vested benefits, service-connected disability benefits, and ordinary disability benefits are payable under five optional forms. Options 2 and 3 provide benefits actuarially equivalent to a lifetime only pension while Option 1 has no reduction.

Option 1 - A benefit is payable to the employee providing on his death, the beneficiary will receive a lump sum equal to the excess, if any, of the employee's contributions over the sum of the payments received.

Option 2 - A reduced benefit payable to the employee with the provision that 100% of the reduced benefit will continue to be paid to the designated beneficiary for life after the death of the employee.

Option 3 - The same as Option 2 except only 50% of the reduced benefit is continued to the designated beneficiary.

Option 5 – Provides for a partial lump sum of between 6 and 36 monthly payments payable under Options 1, 2, 3 or 4. The remaining monthly benefit is reduced so that the partial lump sum plus the reduced benefit is actuarially equivalent to the original benefit.

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*Uniformed:*

Same as municipal, except that police and fire employees may also elect Option 4:

Option 4 - Upon the employee's death, 50% of the benefit will continue to be paid to the surviving spouse for life, provided the employee and spouse were married for two years before retirement and at death. If there is no eligible spouse at the time the employee dies, or the spouse dies before the full amount of the contributions have been returned, 50% of the benefit is continued to dependent children until age 18, or if no dependent children, payments are given to dependent parents for the remainder of their lives. In addition, Option 4 provides for a guaranteed return of employee contributions as described in Option 1 above.

**17. Service-Connected Health Care Benefit**

**Eligibility**

*Municipal:*

Not applicable.

*Uniformed:*

In the event of the death of a uniformed employee during the performance of his or her duties, a service-connected health care benefit may be payable to the surviving spouse and dependent children. Regular payments will be made of the appropriate cost of maintaining medical, dental, optical and pharmaceutical prescription benefits in force at the time of the employee's death. Payments to the spouse cease upon remarriage and to the dependent children at age 18 (age 22 if a full-time student) or if dependent due to physical or mental infirmity, the duration of the infirmity. The health care benefits are not paid from the pension trust assets.

**18. Deferred Retirement Option Plan (DROP)**

**Eligibility**

*Municipal:*

Employees that have 10 years of service and have reached two years after the minimum retirement age may elect to participate in the DROP. During this time, their accrued benefit will go into a DROP account and will earn interest at a specified rate. The rate is calculated each year on January 1 and is equal to the lesser of the yield on 1-year treasury bonds and half of the valuation interest rate as of that date. The benefit is calculated as of the date they entered the DROP. At the end of the DROP, the employees' accrued monthly benefit will commence, plus they will receive the accumulated amount of the accrued benefit paid to the DROP, as well as the interest earned on such benefit.

*Uniformed:*

Same as municipal except that employees are eligible as soon as they have ten years of service and have reached minimum retirement age.

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Employees in all Municipal groups (except elected officials) hired or rehired on or after the Plan 16 effective date (as shown below) are required to participate in the new Stacked Hybrid Plan – Plan 16.

Employees of the Sheriffs’ Office or Register of Wills: June 21, 2018  
Employees represented by AFSCME, District Council 33: August 20, 2016  
Employees represented by AFSCME, District Council 47: January 1, 2019  
Municipal employees not represented by a union: January 1, 2019

Plan 16 benefits are similar to Plan 87, except that the average final compensation used in calculating benefits is limited by the Stacked Hybrid Cap of \$65,000. For DC 33 Plan 16 members, effective January 1, 2019 the Stacked Hybrid Cap is increased from \$50,000 to \$65,000.

Member contributions for Plan 16 members will also be based on compensation capped at \$65,000. Additionally, employees with annual salary (excluding overtime) in excess of \$45,000 will pay additional tier contributions on their total compensation over their base rates as follows: +0.50% for annual salary between \$45,000-\$55,000 and +1.50% for annual salary between \$55,000-\$65,000.

Municipal employee members of Plan 16 who are both not in the civil service and not represented by a union will contribute an additional amount to become vested in seven years instead of ten years.

Plan 16 members will have the option to participate in the Deferred Compensation Plan (DC Plan). For members whose benefits are capped under the retirement plan, the City will match 50% of the members’ contribution up to a maximum of 1.5% of the member’s annual compensation.

## **SUMMARY OF LEGISLATIVE CHANGES**

The following table summarizes member contribution rates by Plan and by bargaining group where applicable. This information has been provided by the Staff and has been applied where effective as of the valuation date.

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Member Contribution Rates by Membership Class			Effective 7/1/2019		
Plan 67	No SSA Coverage	Plan D (Police)		6.00%	
		Plan X (Fire)		6.00%	
		Plan J-(OHCD)		6.00%	Add on for Tier
		Plan J1 (Non Reps; Exempts)		7.00%	Add on for Tier
		Plan J2 (DC 47, DC 33 and OHCD)		7.00%	Add on for Tier
	SSA	Plan J3 (Non Reps-Exempts: excluding Auditing ( <i>Controller</i> ) Department who are not in Civil Service)		4.75%	Add on for Tier
	Plan J4 (DC 47, DC 33)		4.75%	Add on for Tier	
	Plan J6 (Non Civil Service-Auditing Dept EE)		4.75%	Add on for Tier	
Plan 87	Plan A (Fire)		6.84%		
	Plan B (Police)		6.84%		
	Plan L (Elected)		10.75%	Add on for Tier	
	Plan Y		3.49%	Add on for Tier	
	Plan Y (Deputy Sheriffs and Register of Wills)		3.49%	Add on for Tier	
	Plan Y5		4.25%	Add on for Tier	
	Plan L8		12.78%	Add on for Tier	
	Plan Y2 (Non Reps-Exempts:excl Auditing EEs)		3.49%	Add on for Tier	
	Plan Y3 (DC 47, DC 33 and OHCD)		3.49%	Add on for Tier	
	Plan Y4 (Exempts-Auditing/ <i>Controller</i> Dept Ees)		3.49%	Add on for Tier	
Plan 87 Prime Opted out of Plan 10	Plan Y1 (Deputy Sheriff)	DOH>=1/1/2012 and < 6/20/2018	50% of Aggregate Normal Cost of all members in Plan Y	4.15%	Add on for Tier
	Plan Y4 (Non Reps)	DOH>=5/14/2014	+1%	4.49%	Add on for Tier
	Plan Y6 (DC 47)	DOH>=3/5/2014	+1%	4.49%	Add on for Tier
	Plan Y9 (DC33-excluding Guards and OHCD)	DOH>=9/9/2014	+1%	4.49%	Add on for Tier
	Plan Y12 (DC33: Guards)	DOH>= 9/9/2014 and < 11/14/2014	+1%	4.49%	Add on for Tier
	Plan Y11 (Exempts)	DOH>=11/14/2014	+1%	4.49%	Add on for Tier
	Plan Y5.1 (5 yr vesting-Exempts)	DOH>=11/14/2014	+1%	5.25%	Add on for Tier
	Plan L1 (Elected)	DOH>=11/14/2014	+1%	11.75%	Add on for Tier
	Plan L8.1 (Elected)	DOH>=11/14/2014	+1%	13.78%	Add on for Tier
	Plan B6 (Police)	DOH>=1/1/2010 and < 7/1/2017	+1.84%	7.84%	
	Plan B6 (Police)	DOH>=7/1/2017	+2.50%	8.50%	
	Plan A6 (Fire)	DOH>=10/15/2010 and < 7/1/2017	+1.84%	7.84%	
	Plan A6 (Fire)	DOH>=7/1/2017	+2.50%	8.50%	
	Plan 10	Plan B10 (Police)	DOH< 7/1/2017	+1.84%	7.34%
Plan B10 (Police)		DOH>=7/1/2017	+2.50%	8.00%	
Plan A10 (Fire)		DOH< 7/1/2017	+1.84%	7.34%	
Plan A10 (Fire)		DOH>=7/1/2017	+2.50%	8.00%	
Plan Y10					
Deputy Sheriff		DOH >=1/1/2012 and < 6/20/2018	50% of Normal Cost for members of Plan 10	2.33%	Add on for Tier
Register of Wills-MANDATORY		DOH >=1/1/2012 and < 6/20/2018		2.33%	Add on for Tier
DC33-Guards-MANDATORY		DOH>=11/14/2014 and < 8/19/2016		2.33%	Add on for Tier
DC 33	DOH < 8/19/2016				
Non-Reps, DC 47		2.33%		Add on for Tier	
Elected		2.33%		Add on for Tier	
Exempts (5 yr vesting-Exempts)		2.75%	Add on for Tier		
Plan 16	Plan S16				
	Deputy Sheriffs and Register of Wills	DOH >= 6/21/2018	Pensionable Earnings up to \$65,000	4.04%	Add on for Tier
	DC 33	DOH >= 8/20/2016		4.04%	Add on for Tier
	Non-Reps, DC 47	DOH >= 1/1/2019		4.04%	Add on for Tier
Exempts (7 yr vesting-Exempts)	DOH >= 1/1/2019	4.53%		Add on for Tier	

**APPENDIX E – GLOSSARY OF TERMS**

**1. Actuarial Liability**

The Actuarial Liability is the difference between the present value of all future system benefits and the present value of total future normal costs. This is also referred to by some actuaries as the “accrued liability” or “actuarial accrued liability.”

**2. Actuarial Assumptions**

Estimates of future experience with respect to rates of mortality, disability, turnover, retirement rate or rates of investment income and salary increases. Actuarial assumptions (rates of mortality, disability, turnover, and retirement) are generally based on past experience, often modified for projected changes in conditions. Economic assumptions (salary increases and investment income) consist of an underlying rate in an inflation-free environment plus a provision for a long-term average rate of inflation.

**3. Accrued Service**

Service credited under the System which was rendered before the date of the actuarial valuation.

**4. Actuarial Equivalent**

A single amount or series of amounts of equal actuarial value to another single amount or series of amounts computed on the basis of appropriate actuarial assumptions.

**5. Actuarial Funding Method**

A mathematical budgeting procedure for allocating the dollar amount of the actuarial present value of a retirement system benefit between future normal cost and actuarial accrued liability. Sometimes this is referred to as the “actuarial cost method.”

**6. Actuarial Gain/(Loss)**

The difference between actual experience and actuarial assumption anticipated experience during the period between two actuarial valuation dates.

**7. Actuarial Present Value**

The amount of funds currently required to provide a payment or series of payments in the future. It is determined by discounting future payments at predetermined rates of interest, and by probabilities of payment.

**APPENDIX E – GLOSSARY OF TERMS**

**8. Adjusted Market Value of Assets**

An asset value reflecting a five-year smoothing of asset gains and losses, as described in the Philadelphia Municipal Code Title 22-311.

**9. Amortization**

This term represents the paying off an interest-discounted amount with periodic payments of interest and principal—as opposed to paying off with a lump sum payment.

**10. Normal Cost**

The actuarial present value of retirement system benefits allocated to the current year by the actuarial funding method.

**11. Unfunded Actuarial Liability (UAL)**

The difference between actuarial liability and valuation assets. This is sometimes referred to as “unfunded actuarial accrued liability.”

Most retirement systems have unfunded actuarial liabilities. They typically arise each time new benefits are added and each time experience gains/losses are realized.

The existence of unfunded actuarial accrued liability is not in itself an indicator of poor funding. Also, unfunded actuarial liabilities do not represent a debt that is payable today. What is important is the ability of the plan sponsor to contribute the annual amortized cost to fund down the unfunded actuarial liability and the trend in unfunded actuarial liability amount.