

City of Philadelphia Municipal Retirement System

Actuarial Valuation Report as of July 1, 2016

Produced by Cheiron

March 2017

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LETTER OF TRANSMITTAL

March 24, 2017

City of Philadelphia Municipal Retirement System
Two Penn Center Plaza – 16th Floor
Philadelphia, PA 19102-1721

Dear Board Members:

At your request, we have performed the July 1, 2016 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 #23. The results of this report are only applicable to the System's contribution for Fiscal Year Ending 2018. 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.

To the best of our knowledge, this report has been prepared in accordance with generally recognized and accepted actuarial principles and practices which are consistent with the Code of Professional Conduct and applicable Actuarial Standards of Practice set out by the Actuarial Standards Board. 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.

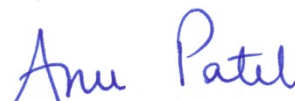
This actuarial valuation report was prepared exclusively for the City of Philadelphia Municipal Retirement System for the purposes described herein and for the plan auditor in completing an audit related to the matters herein. Other users of this report are not intended users as defined in the Actuarial 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, EA, MAAA
Principal Consulting Actuary

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

Anu Patel, FSA, EA, MAAA
Principal Consulting Actuary

**CITY OF PHILADELPHIA MUNICIPAL RETIREMENT SYSTEM
JULY 1, 2016 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) 2018,
- 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, 2016 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.

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A. Valuation Basis

The June 30, 2016 valuation results are based on the same actuarial methods and assumptions as used in the June 30, 2015 valuation except for the decrease in interest rate from 7.75% to 7.70% as of July 1, 2016.

Council Bill No. 161013 passed in December 2016 provided for two changes in Plan provisions for employees represented by AFSCME District Council 33 (DC 33):

- DC 33 members hired or rehired on or after August 20, 2016 will participate in a new 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 \$50,000.
- Current and new DC 33 members will pay additional contributions that are tiered to increase based on pay
- These new provisions do not affect this years' cost determination but are reflected in the projections provided in this sections

There are two sources of anticipated additional revenue that will be received by the System – 1) a portion of the sales tax revenue according to the State Legislation and 2) additional tiered member contributions based on salary level for current and future DC #33 members. Typically, as additional contributions are received, the following years' MMOs are reduced as a function of the additional assets. However, City's objective is for these additional revenue sources to be specifically dedicated toward paying down the unfunded liability and not to reduce future costs for the City. Under the new **Revenue Recognition Policy** the additional revenue is tracked and accumulated in a notional account which is then deducted from the Actuarial Asset Value to determine the contribution under this policy resulting in a higher contribution than the Minimum Municipal Obligation (MMO). These amounts will be paid in addition to what the MMO would be without the additional assets attributable to the sales tax and tiered member contributions.

At the same time we calculate the MMO for state reporting purposes and for Government Accounting Standards purpose including all assets.

For a detailed description of all methods and assumptions used, refer to Appendix C of this report.

This report was prepared using census data and financial information as of July 1, 2016 and does not reflect any subsequent changes in the membership or the assets.

Below we highlight significant results of this valuation. Table I-1 summarizes these results:

- **Financial Performance:** The return on market value of assets at -3.17% for the year ending June 30, 2016 was lower than expected when benchmarked against the assumed 7.75% return rate. For funding purposes the System applies a smoothing method develop an 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, 2016 was 4.45% resulting in an experience loss when compared to the 7.75% assumption.

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- 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 increased from 104.9% in the prior year to 113.5% for the current year.
- ***Pension Adjustment Fund (PAF)***: As defined in the Philadelphia Code the PAF provides for additional benefit distributions through the use of excess earnings. The asset return for the adjusted market value which is based on five-year smoothing of asset gains and losses was 4.43%. Because the return is below 8.75% (the assumed prior year rate of return of 7.75% plus 1.00%), there are no additional amounts transferred into the PAF as of June 30, 2016.
- ***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 increased from \$5.937 billion as of July 1, 2015 to **\$6.089 billion as of July 1, 2016** reflecting the effect of asset and liability losses from July 1, 2015 through June 30, 2016 as well as the decrease in discount rate as of July 1, 2016.
 - The experience loss represents \$214.5 million increase in the UAL. This is comprised of a \$65.6 million liability loss attributable to losses from new entrants with past service, salary growth higher than expected and mortality experience on retirees plus \$148.8 million asset loss. There was an increase in UAL of \$51.2 million due to the decrease in interest rate.
- ***Funding Ratio***: This is the ratio of the System's AVA to AL. The funding ratio decreased from 45.0% as of July 1, 2015 to **44.8% as of July 1, 2016** mainly due to the experience losses and the change in interest rate assumption. While this ratio may appear to reflect lack of progress in funding, the decrease in the assumed rate of return represents improvement of System's risk profile improving the likelihood of achieving this assumption in the future. The funding ratio on market assets to liability basis decreased from 42.9% to 39.5% reflecting the loss on the asset returns that is being recognized in the future under the asset smoothing method.
- ***Plan Changes***: The two changes in plan provisions impact future costs (Stacked Hybrid Plan for new hires) and future contributions (tier member contributions for current and future hires) and therefore do not have an impact on the AVA or AL as of July 1, 2016.
- ***Minimum Municipal Obligation (MMO)***: The MMO is the required minimum amount the City must contribute under Pennsylvania State Law. The MMO increased from \$629.6 million for FYE 2017 to **\$657.8 million for FYE 2018**.
- ***Revenue Recognition Policy (RRP)***: The contribution based on the RRP is **\$658.7 million for FYE 2018**. The balance of the notional account removed from the assets in calculating this contribution is \$9.5 million as of July 1, 2016.

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- **Contribution under the City’s Funding Policy:** The beginning-of-year contribution under the City’s Funding Policy increased from \$978.5 million for FYE 2017 based upon actual FYE 2016 payroll to an estimated **\$1,047.3 million for FYE 2018**.

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

Table I-1 Key Results (\$ thousands)			
Valuation Date	7/1/2016	7/1/2015	
Unfunded Actuarial Liability	\$ 6,088,778	\$ 5,936,979	
Funding Ratio	44.8%	45.0%	
	Fiscal Year 2018	Fiscal Year 2017	
Minimum Municipal Obligation	\$ 657,832	\$ 629,620	
Revenue Recognition Policy Contribution	\$ 658,714	\$ 629,620	
City's Funding Policy Contribution*	\$ 1,047,294	\$ 978,510	

*The City’s funding policy contribution for FYE 2017 was updated based upon the actual payroll of \$1,676.5 million (provided as pay rates in the data) as of July 1, 2016. In the July 1, 2015 actuarial valuation report, the estimated FYE 2017 payroll was \$1,650.6 million based upon July 1, 2015 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, 2016 valuation and how they compare to the results from the July 1, 2015 valuation.

1. City Membership:

As shown in Table I-2 below, total membership in the Retirement System increased by 0.4% from 2015 to 2016.

Table I-2 Membership Total				
	July 1, 2016	July 1, 2015	% Change	
Actives	28,308	27,951	1.3%	
Terminated Vesteds	1,248	1,334	-6.4%	
Disabled	4,005	4,016	-0.3%	
Retirees	22,412	22,245	0.8%	
Beneficiaries	8,567	8,566	0.0%	
DROP	1,614	1,784	-9.5%	
Total City Members	66,154	65,896	0.4%	
Annual Salaries	\$ 1,676,548,962	\$ 1,597,848,869	4.9%	
Average Salary per Active Member	\$ 59,225	\$ 57,166	3.6%	
Annual Retirement Allowances	\$ 741,828,339	\$ 719,580,951	3.1%	
Average Retirement Allowance	\$ 21,205	\$ 20,662	2.6%	

The active participant population increased by 1.3% during the 2015-2016 plan year. Deferred Retirement Option Plan (DROP) participants decreased 9.5% from 2015 to 2016 as members reached the end of their four-year DROP participation period. The average salary per active member increased by 3.6% during the plan year. The result of higher active membership paired with the salary growth produced a total payroll growth higher than expected of 4.9% versus the expected 3.3% payroll growth assumption.

Annual retirement allowances continued to increase, growing by 3.1% this year and reflects a 2.6% increase in the average benefits provided. The total number of participants in pay status increased 0.5%.

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

2. City Assets and Liabilities:

Table I-3 presents a comparison between the July 1, 2016 and July 1, 2015 system assets, liabilities, UAL, and funding ratios. The Funding Ratio decreased from 45.0% as of July 1, 2015 to **44.8%** as of July 1, 2016 due to the asset losses, liability losses, and decrease in interest rate assumption. Prior to the interest rate assumption changes the funded ratio would have been 45.0%.

Table I-3 Assets and Liabilities (\$ thousands)				
	July 1, 2016	July 1, 2015	% Change	
Actuarial Liabilities by Membership:				
Actives	\$ 3,759,083	\$ 3,599,336	4.4%	
Terminated Vesteds	120,291	126,357	-4.8%	
Disabled	750,685	726,996	3.3%	
Retirees	5,029,339	4,896,290	2.7%	
Beneficiaries	635,323	616,393	3.1%	
DROP	722,743	828,281	-12.7%	
Non-Vested Refunds	7,334	6,739	8.8%	
Total Actuarial Liability (AL)	\$ 11,024,798	\$ 10,800,392	2.1%	
Market Value of Assets (MVA net of PAF)*	\$ 4,350,752	\$ 4,636,053	-6.2%	
Actuarial Value of Assets (AVA net of PAF)*	\$ 4,936,020	\$ 4,863,413	1.5%	
Actuarial Assets minus Market Assets	\$ 585,268	\$ 227,360	157.4%	
Unfunded Actuarial Liability	\$ 6,088,778	\$ 5,936,979	2.6%	
Funding Ratio (AVA ÷ AL)	44.8%	45.0%	-0.2%	
Funding Ratio (MVA ÷ AL)	39.5%	42.9%	-3.4%	

*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 was -3.17% compared to the 7.75% assumption for the previous year. For the actuarial value of assets, the experience gains and losses are smoothed over future years, which yielded a rate of return of 4.45%.

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3. Components of UAL Change between July 1, 2015 and July 1, 2016:

The Retirement System's unfunded actuarial liability increased by \$151.8 million, from \$5,937.0 million as of July 1, 2015 to \$6,088.8 million as of July 1, 2016. Table I-4 presents the specific components of this change in the UAL.

The System experienced a \$148.8 million asset loss based upon the actuarial value of assets and a \$65.6 million liability loss which is attributable to demographic experience. There was also an additional liability of \$51.2 million recognized due to the change in assumptions (decrease in interest rate from 7.75% to 7.70%) Actual FYE 2016 contributions when compared to the expected MMO created a net gain of \$16.2 million due to higher than expected contributions and timing of contributions. There was a \$23.1 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 increase in the UAL of \$151.8 million over what is expected as of July 1, 2016.

Table I-4	
Change in Unfunded Actuarial Liability (UAL)	
(\$ thousands)	
Experience	
1. UAL change due to asset (gain)/loss*	\$ 148,839.8
2. UAL change due to overall liability (gain)/loss	\$ 65,611.1
Contributions	
3. UAL change due to difference in benefit accruals, actual contributions and timing	\$ (16,221.9)
4. UAL change due to one-year delay in MMO contributions	\$ 23,102.0
Total (Gain)/Loss Amortization Base	
5. Total UAL change due to gains and losses: sum 1 through 4	\$ 221,331.0
Plan Changes	
6. UAL change due to plan changes	\$ 0
Assumption Changes	
7. UAL change due to assumption changes	\$ 51,180.9
Total	
8. Total net overall change: 5 + 6 + 7	\$ 272,511.9
9. UAL change due to benefit accruals and payments, contributions, and interest	<u>(120,712.5)</u>
10. Net increase/(decrease) in UAL: 8 + 9	\$ 151,799.4

* Includes loss due to PAF transfer

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4. Contributions:

Table I-5 below summarizes the City contribution amounts. The **Minimum Municipal Obligation** for FYE 2018 measured as of the beginning of the year decreased by 0.17% of payroll, from 38.15% to 37.98%. In dollar terms, the required beginning of year contribution increased from \$629.6 million to \$658.7 million, a \$28.2 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.

This is the first year for calculating the contribution under the **Revenue Recognition Policy**. For FYE 2018, the contribution is \$658.7 million. The RRP contribution is slightly higher than the MMO due to excluding accumulated sales tax revenue received from the assets when determining the RRP contributions.

The contribution under the **City's Funding Policy** for FYE 2017 was originally estimated to be \$979.0 million based upon estimated FYE 2017 payroll. Using updated payroll, the FYE 2017 contribution is \$978.5 million. For Fiscal Year 2018, the funding policy contributions increased by 2.11% of payroll, from 58.36% to 60.47%. In dollar terms, the contributions under the City's Funding Policy increased from \$978.5 million to \$1,047.3 million, a \$68.8 million increase. Along with changes in assumptions and experience, the increase in the funding policy is attributable to experience losses for each year the actual City contributions are less than the policy amount. The FYE 2018 contributions under the City's Funding Policy will be updated next year based on actual payroll. All contributions for the City's Funding Policy are provided as of the beginning of the year.

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

Table I-5 Contributions (\$ thousands)				
Fiscal Year Ending in Year:	2018	% of Pay	2017	% of Pay
Minimum Municipal Obligation ¹				
Estimated FY Payroll	\$ 1,731,875		\$ 1,650,578	
Normal Cost (with Expenses)	\$ 164,427	9.49%	\$ 156,220	9.46%
Employee Contributions	<u>(69,756)</u>	4.03%	<u>(65,652)</u>	3.98%
City Normal Cost	\$ 94,671	5.47%	\$ 90,568	5.49%
Amortization Payment	<u>563,161</u>	32.52%	<u>539,052</u>	32.66%
Minimum Municipal Obligation	\$ 657,832	37.98%	\$ 629,620	38.15%
Revenue Recognition Policy ²				
Estimated FY Payroll	\$ 1,731,875		\$ 1,650,578	
Normal Cost (with Expenses)	\$ 164,427	9.49%	\$ 156,220	9.46%
Employee Contributions	<u>(69,756)</u>	4.03%	<u>(65,652)</u>	3.98%
City Normal Cost	\$ 94,671	5.47%	\$ 90,568	5.49%
Amortization Payment	<u>564,043</u>	32.57%	<u>539,052</u>	32.66%
Revenue Recognition Policy	\$ 658,714	38.03%	\$ 629,620	38.15%
City's Funding Policy ³				
Estimated FY Payroll	\$ 1,731,875		\$ 1,676,549 ⁴	
Normal Cost (with Expenses)	\$ 164,427	9.49%	\$ 156,769	9.35%
Employee Contributions	<u>(69,756)</u>	4.03%	<u>(66,685)</u>	3.98%
City Normal Cost	\$ 94,671	5.47%	\$ 90,084	5.37%
Amortization Payment	<u>952,623</u>	55.01%	<u>888,426</u>	52.99%
City's Funding Policy	\$ 1,047,294	60.47%	\$ 978,510	58.36%

¹ The MMO does not include Quasi-Agency contributions.

² Revenue Recognition Policy is based on the calculation of MMO without including accumulated sales tax revenue amounts received.

³ Assuming beginning-of-year payment.

⁴ FY 2017 Payroll for the City's Funding Policy is based upon the 7/1/2016 pay rates and will be finalized when the FYE 2017 payroll is available. All other payroll is estimated based upon the prior year's data used for the actuarial valuation.

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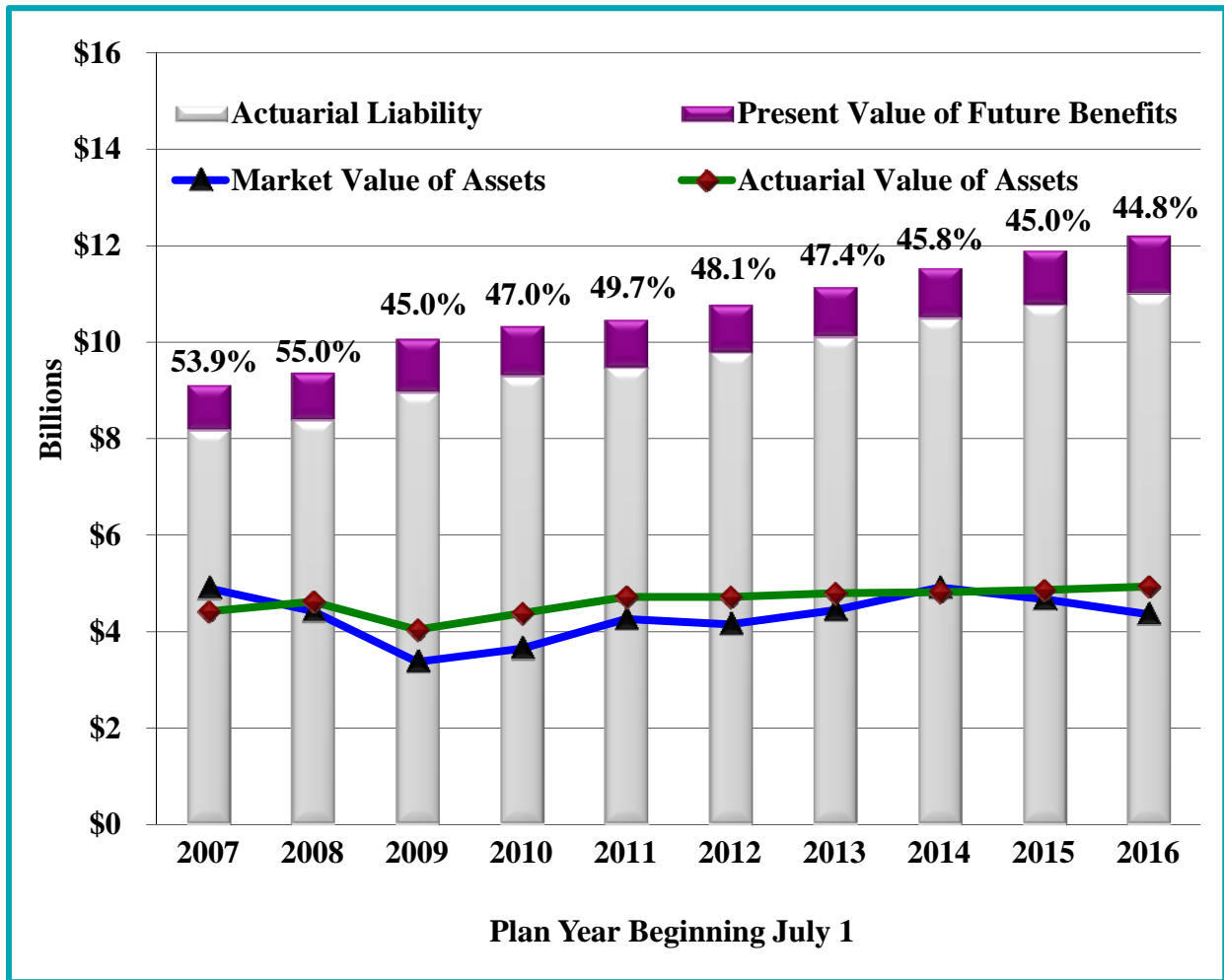
SECTION I - BOARD SUMMARY

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 2007.

City of Philadelphia Assets* and Liabilities – 2007 to 2016



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

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The System's funding ratio has declined significantly since 2007. In 2009, the funding ratio declined by 10% due to the investment losses during the year 2009 and the change in the actuarial liability interest rate assumption. In particular, the assumed interest rate assumption has been decreased during this period from 8.75% to 7.70%. 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 2016, the funding ratio decreased by 0.2% due to experience losses and decrease in the interest rate assumption.

This historic trend emphasizing the relatively low funded 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.

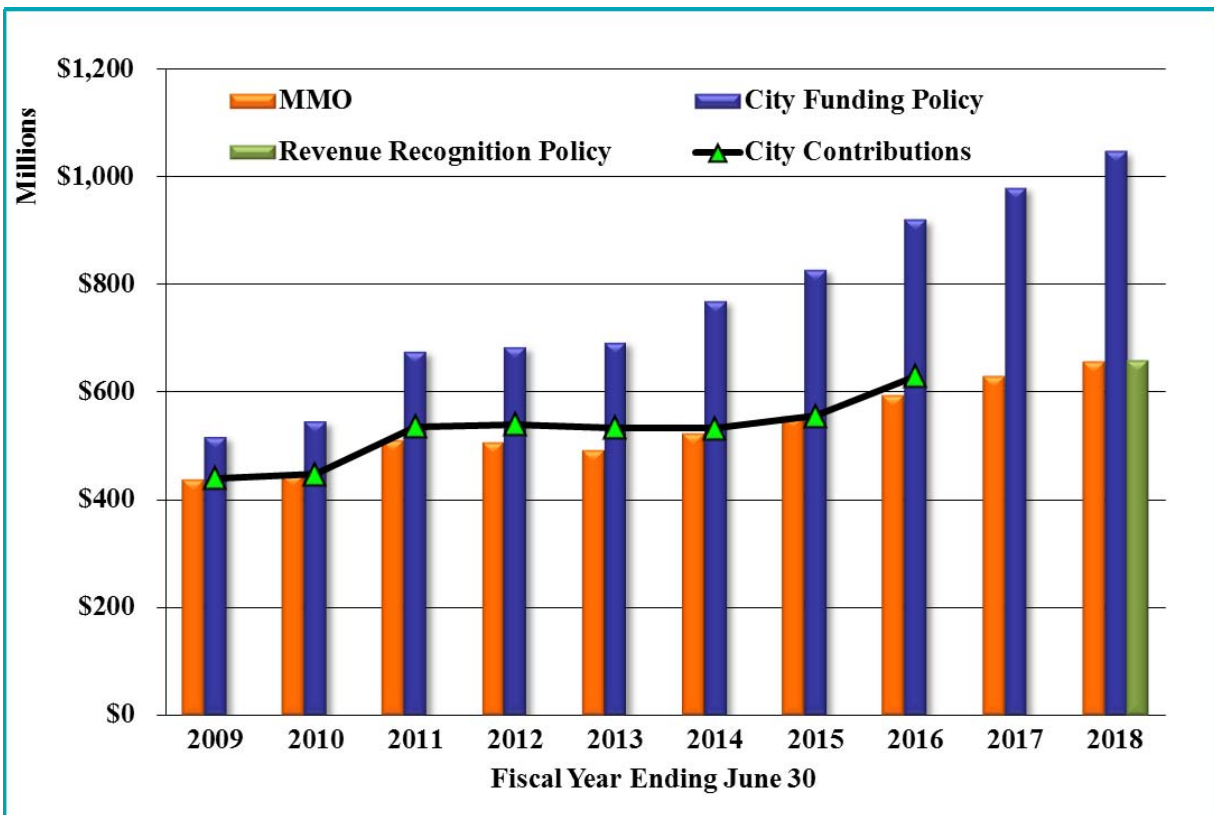
Another observation relevant to this System is that assets have remained relatively flat over the projection period. This is a function of the significant negative cash flow as contributions and investment income have just barely kept pace with benefit payouts and expenses. This is demonstrated later in the summary section.

In the chart on the next page, we present historical trends for the Minimum Municipal Obligation (MMO), the contribution under the City's Funding Policy, the Revenue Recognition Policy (RRP), and the actual contribution made for fiscal years since 2009. 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 2017 and 2018. The FYE 2010 and 2011 City contributions include the \$150 million and \$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 2016 was the first year sales tax revenue was received in the amount of \$9.7 million.

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City of Philadelphia Contributions for Fiscal Years 2009-2018



The key trend illustrated in this chart is the continuous growth in all measures since FYE 2009 due in part to ten year smoothing of 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. In addition, the MMO and City’s Funding Policy amounts for FYE 2011 increased significantly mainly due to the investment losses and changes in assumptions.

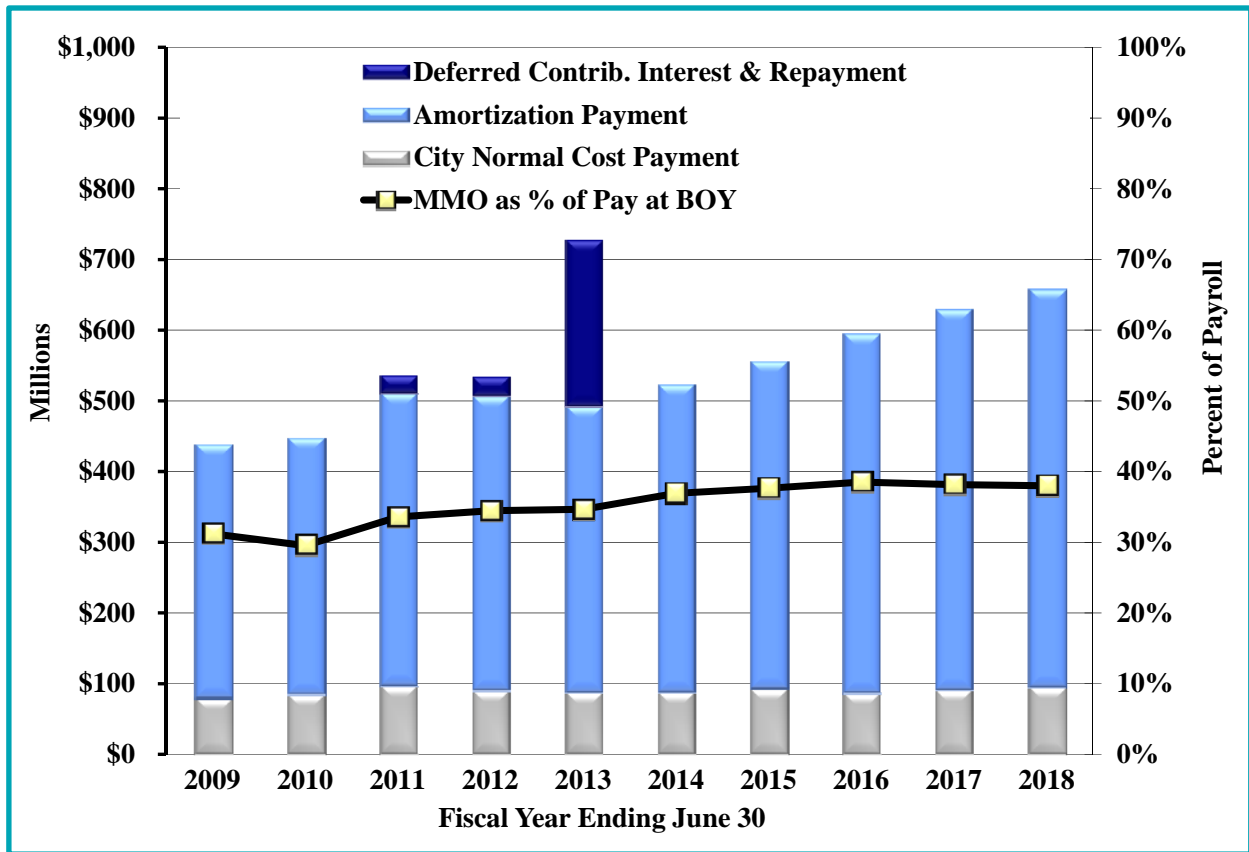
The RRP is shown in the green bar for the first time in FYE 2018. In FYE 2018, the RRP is approximately \$0.9 million higher than the MMO. In future years, as the tax revenue and tiered member contributions paid in excess of the MMO accumulate, the gap between the MMO and the RRP will continue to grow.

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The chart below shows the historical amortization payments, City normal cost payments, and the deferred contribution interest and principal repayment. Also shown is the beginning-of-year MMO (normal cost plus amortization payments only, not including the deferred contributions) as a percentage of payroll based on the values in the legend on the right versus the line graph. For example in 2017 and 2018, the City cost is expected to be about 38%.

MMO Contributions by Source for Fiscal Years 2009-2018



The chart illustrates that the City normal cost payment has increased gradually over the period shown. The amortization payment to pay off the unfunded actuarial liability has increased from \$360 million for FYE 2009 to just over \$563 million for FYE 2018. 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 31% in 2009, decreased in 2010 and then increased as the investment losses of FYE 2008 and 2009 get recognized over time to the current level of approximately 38% in FYE 2018.

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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, 2016 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 as a percent of payroll. Unless otherwise noted we assume the RRP contributions are made each year. Our illustrations assume the provisions of Act 205 as amended by Act 44 remain in force during the projection period.

These projections assume that new 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 DC #33 who will participate in the Stacked Hybrid Plan - Plan 16. Stacked plan benefits and contributions are based on pay up to a cap of \$50,000 resulting in lower future costs for this group.

All projections include expected additional funds from sales tax revenue and tiered member contributions for current and future DC #33 members. The amounts of expected sales tax provided to us by the City (as shown in the table below) reflect a reduction in the sales tax revenue by \$15 million in each of the first two years to provide the resources for debt financing.

The treatment of the sales tax and tiered 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, it is our understanding the City has agreed to dedicate the benefit from the sales tax revenue and additional tiered member contributions 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.

Fiscal Year Ending	2017	2018	2019	2020	2021
Expected Sales Tax	\$ 16,084,426	\$ 21,146,316	\$ 41,657,220	\$ 47,260,864	\$ 52,851,997
Fiscal Year Ending	2022	2023	2024	2025	2026
Expected Sales Tax	\$ 57,173,297	\$ 61,602,629	\$ 66,142,695	\$ 70,796,263	\$ 75,566,169
Fiscal Year Ending	2027	2028	2029	2030	2031
Expected Sales Tax	\$ 80,455,323	\$ 85,466,706	\$ 90,603,374	\$ 95,868,458	\$ 101,265,170
Fiscal Year Ending	2032	2033	2034	2035	2036
Expected Sales Tax	\$ 106,796,799	\$ 112,466,719	\$ 118,278,387	\$ 124,235,347	\$ 130,341,230

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The projections are provided on two different asset return assumption bases:

- 1) Assuming the new 7.70% return assumption each and every year, and
- 2) Assuming returns in the table below. These are rates of return which vary each year, but over the projection period equal on average the assumed 7.70% return. We do this because the City's 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. These rates are shown for illustration purposes only and are not a prediction of actual returns.

Fiscal Year	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025
Beginning										
Return	9.0%	4.3%	9.5%	7.3%	11.2%	11.8%	13.1%	9.7%	6.5%	-2.0%
Fiscal Year	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035
Beginning										
Return	-1.0%	15.1%	-2.5%	5.25%	11.5%	7.7%	8.5%	14.1%	10.7%	6.5%

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 because it would effectively extend the period to achieve full funding many years beyond the current projection period illustrated.

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Projection Set 1: Assets and Liabilities

The two charts on the following page show 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). If the City was to contribute based on the MMO as defined under Act 205 the System is expected to reach 80% in 2032 and 100% funded by 2040. 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 while the full impact of the 2008/2009 investment losses are fully realized. This is also a reflection of the negative cash flow of the System discussed below.

The alternative return expectations reveal insight from these two charts as to how varying investment returns impact the System's funding ratio.

In both projections, 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. What should be apparent is while achieving the same average return over the projection period, when returns actually vary the funded ratio is below the projection of consistent 7.70% returns each year and does not achieve full funding during this projection period – this demonstrates the risk of negative cash flow.

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Chart 1A: Projection of Assets and Liabilities, 7.70% return each year and City makes contributions based on MMO

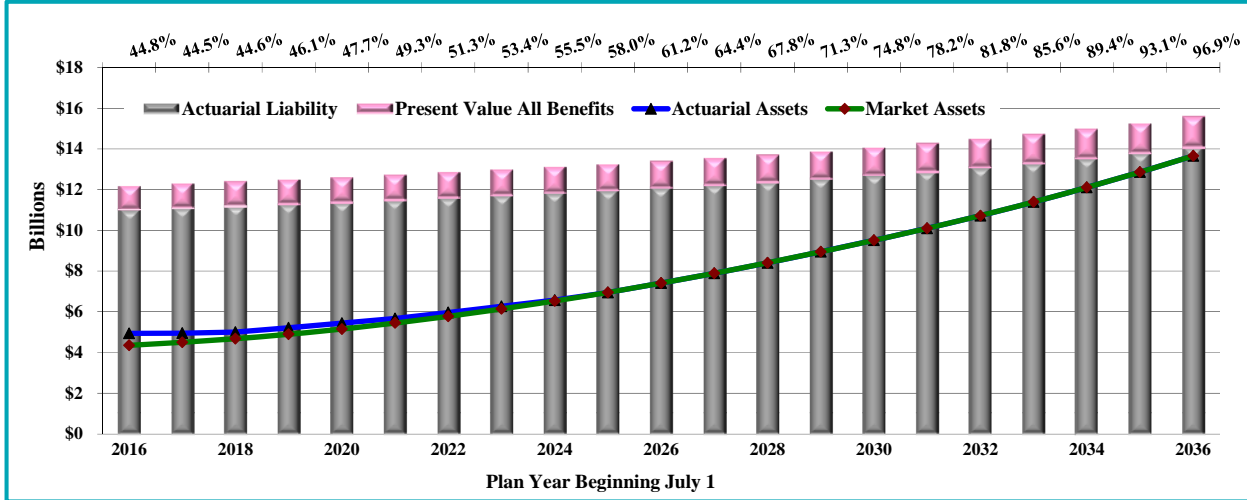


Chart 2A: Projection of Assets and Liabilities, varying returns averaging 7.70% and City makes contributions based on MMO

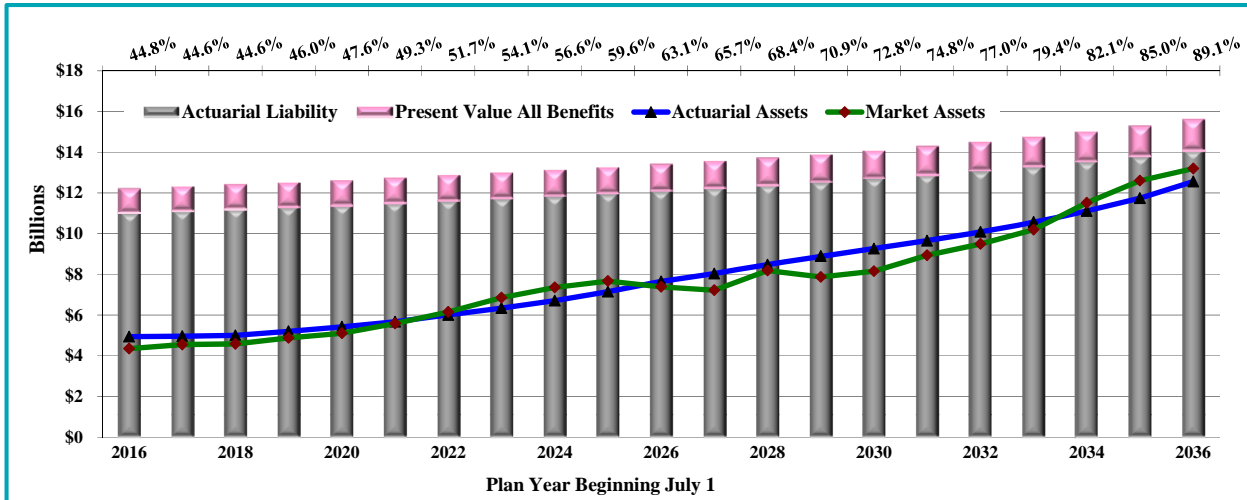


Chart 2A demonstrates that if the system can achieve a long-term return rate of 7.70%, the funding ratio can be adversely impacted by volatile returns year by year. This component of funding risk is driven by negative cash flows (where benefit payments and expenses are greater than contributions). When 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.

It is also important to consider the fact that as long as the System is significantly underfunded, the financial burden on the City will remain relatively high, and the only reason both of these

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projections show gradual improvement is because the contributions will be adjusted to cover any cost volatility to comply with MMO requirements under Act 205.

However, the impact of these issues is mitigated **under the RRP** by the additional contributions from sales tax revenue and tiered member contributions which are anticipated to be contributed above the City’s MMO resulting in a faster improvement in funded status. This is illustrated in the charts for Revenue Recognition Policy where the additional contributions accelerate the year the System is expected to reach 100% funding from the year 2040 to 2035.

Chart 3A: Projection of Assets and Liabilities, 7.70% return each year and City makes contributions based on Revenue Recognition Policy

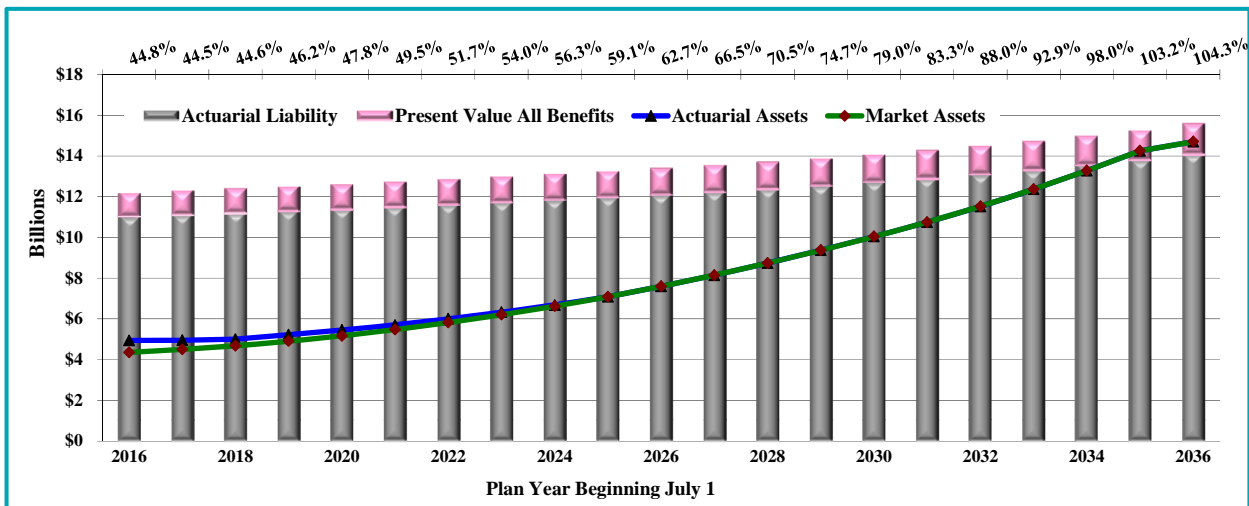


Chart 3A illustrates the impact on the funded status when the additional revenue from sales tax and tier contribution is specifically used to pay down the unfunded liability under the Revenue Recognition Policy as opposed to reducing future costs. As you can see, while the System is still expected to be 80% funded by 2031 the System achieves 100% funded by 2035, five years earlier. By the end of the projection period the System is expected to be funded at 104.3% compared to 96.9% in chart 1A.

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Chart 4A: Projection of Assets and Liabilities, varying returns averaging 7.70% and City makes contributions based on Revenue Recognition Policy

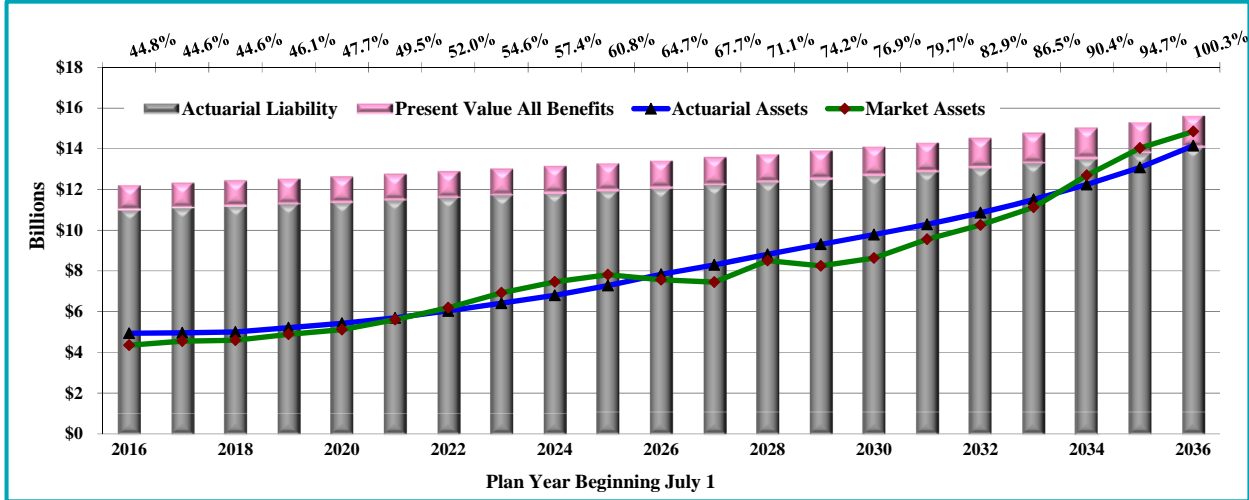
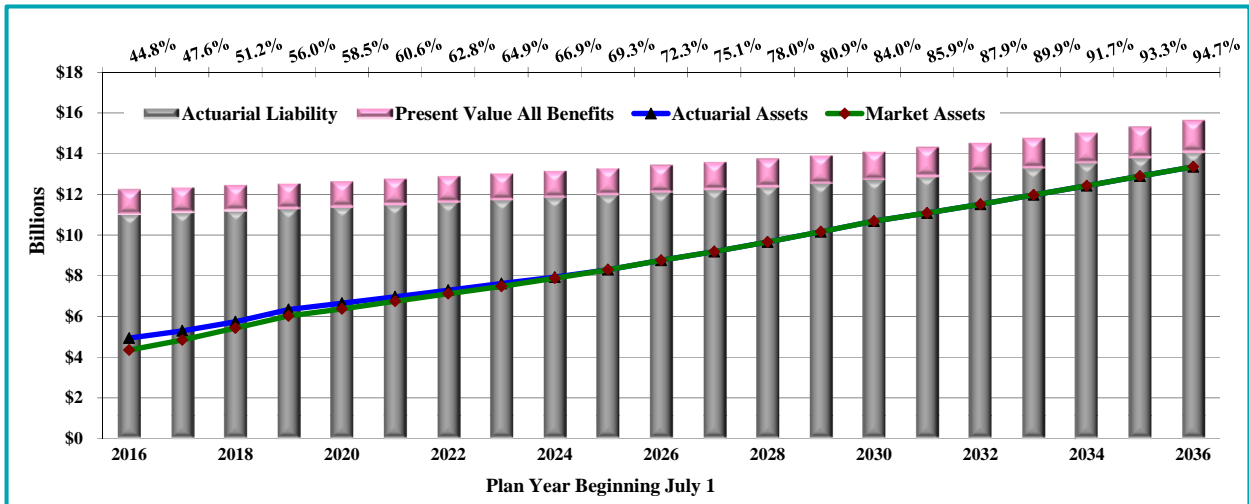


Chart 4A continues to show how negative cash flows can impact the System. The average return over the period of the projection is 7.70% results in a funded ratio of 100.3% as of July 1, 2036 instead of 104.3% which is the result of a constant return rate.

Chart 5A: Projection of Assets and Liabilities, 7.70% return each year, and the City makes contributions based on the City's Funding Policy



In the above scenario, where the City's Funding Policy is contributed every year, the System reaches a funded ratio of 94.7% at the end of the projection period but achieves 80% funded earlier by 2029 because of the significantly higher contributions due immediately. For this scenario we have assumed that the City may use 1) the sales tax revenue to meet the requirements of the Funding Policy and 2) the tiered contributions to reduce City's portion of the normal cost and that such amounts would not be in addition to the policy. Over time the contributions under the Funding Policy are lower than the RRP therefore resulting in a lower

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funded ratio by the end of the projection period. We project the contribution amounts in support of these funding graphs in the next section.

Chart 6A: Projection of Assets and Liabilities, if the City makes contributions based on the Funding Policy, varying returns averaging 7.70%

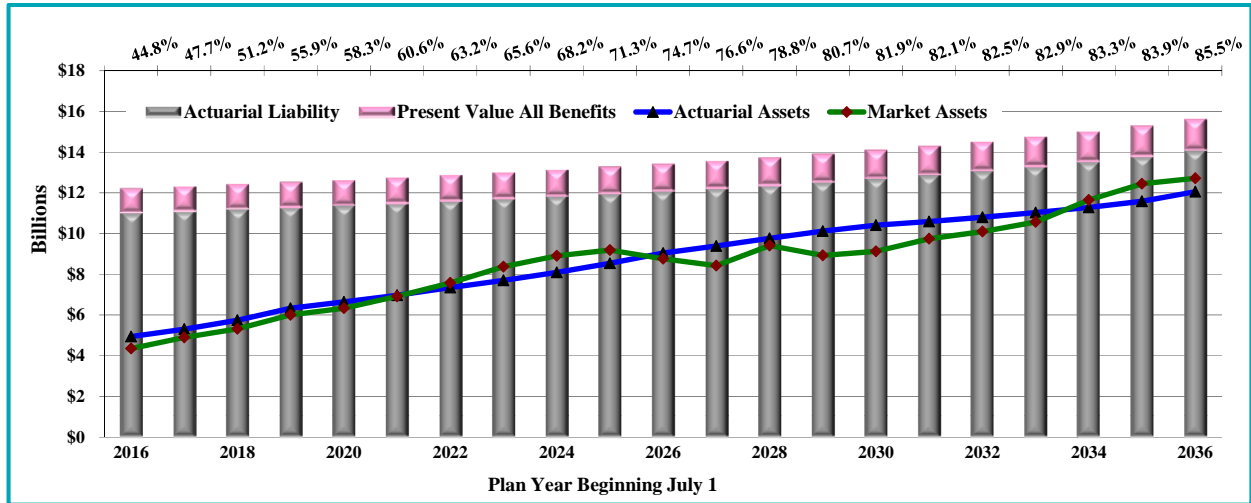


Chart 6A again demonstrates that even if the return is achieved on average, because of negative cash flows the funded ratio could be less than long-term expectations might imply.

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Projection Set 2: Projected City Contribution Rate

The chart below shows the MMO (red bars) including the impact on MMO reductions as a function of expected sales tax revenue (blue bars) and expected tiered 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 tiered member contributions that are expected to be contributed on top of the MMO. The decrease in FYE 2020 for the City’s Funding Policy (blue line) is due to the payment in full of the initial unfunded liability. This projection assumes all actuarial assumptions are met, including the 7.70% anticipated investment return assumption, the MMO contributions are made each year and sales tax revenue and tiered member contributions are received as anticipated.

Chart 1B: Projection of City Contributions, 7.70% return each year and the City makes contributions based on MMO

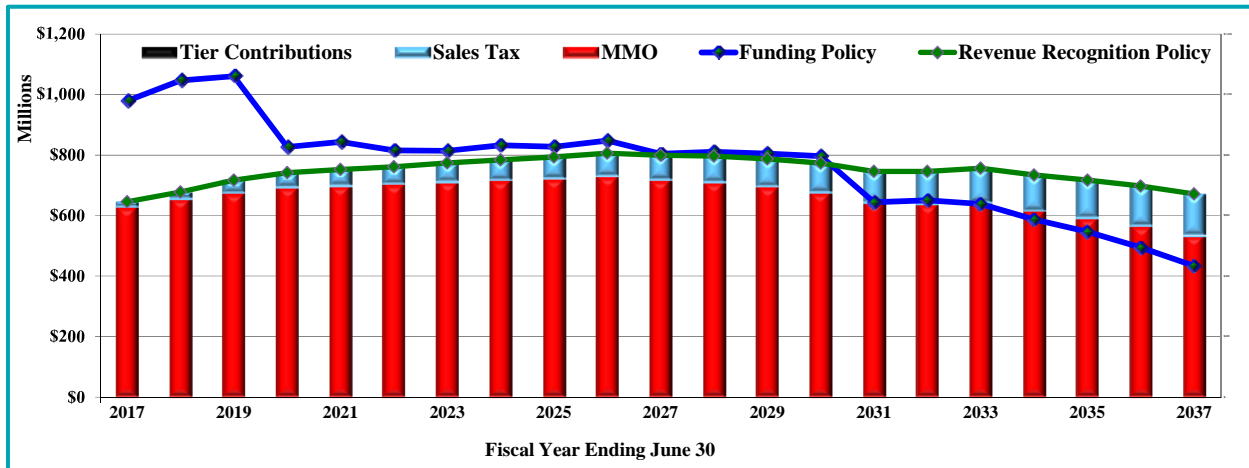
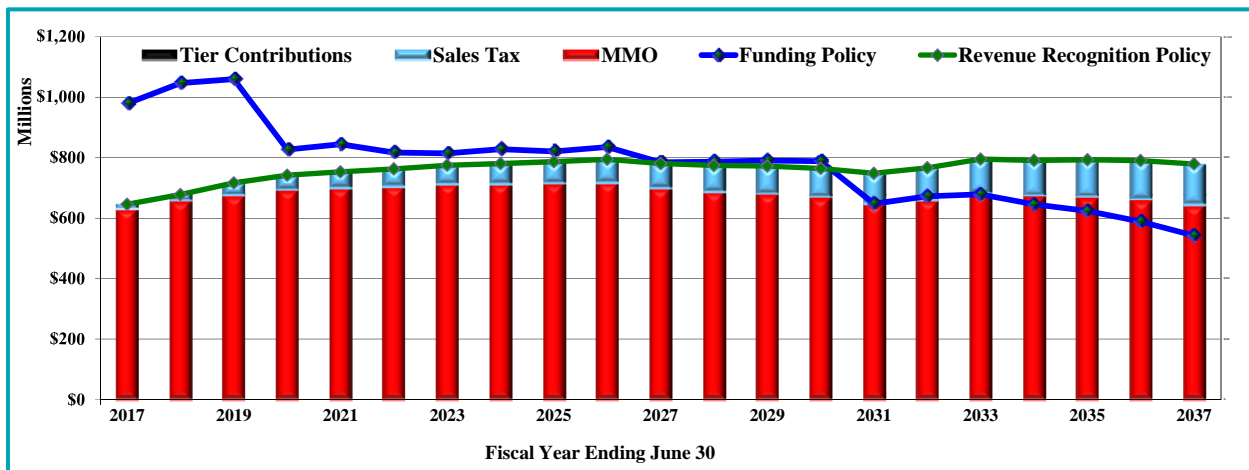


Chart 2B: Projection of City Contributions, varying returns averaging 7.70% and the City makes contributions based on the MMO



As shown above, varying returns have an impact on the computed City contributions, especially in the later projection years. However, the volatility is mitigated for two reasons, the 10-year

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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.

Chart 3B: Projection of City Contributions, 7.70% return each year and the City makes contributions based on the Revenue Recognition Policy

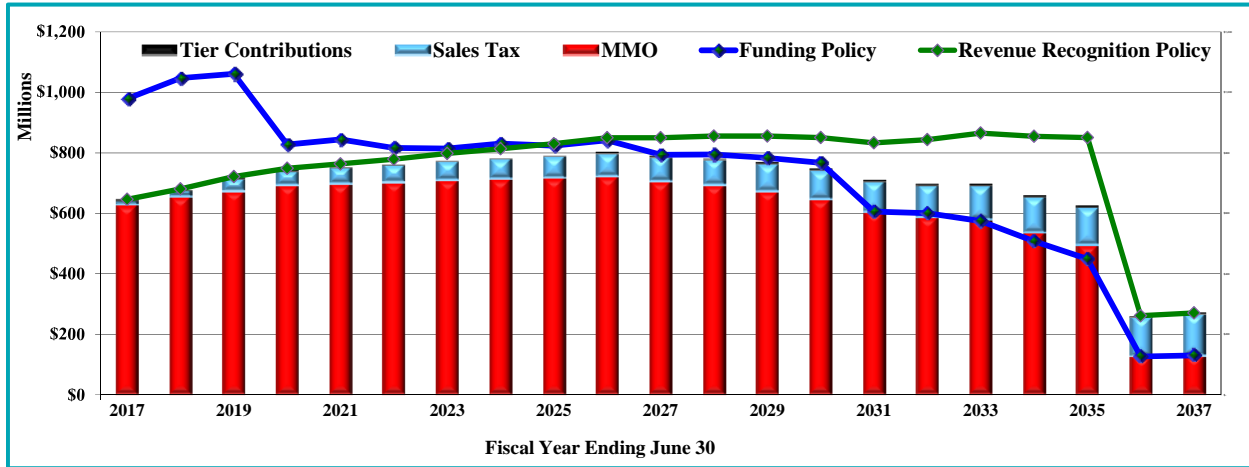


Chart 3B shows the future expected contributions based on the City paying the Revenue Recognition Contribution each year - the sales tax revenue and additional tier contributions are included in the green line which shows the RRP contributions. The RRP contribution is higher than the MMO until the System reaches 100% funded in FYE 2036 at which time it drops to the normal cost rate.

Chart 4B: Projection of City Contributions, varying returns averaging 7.70% and the City makes contributions based on the Revenue Recognition Policy

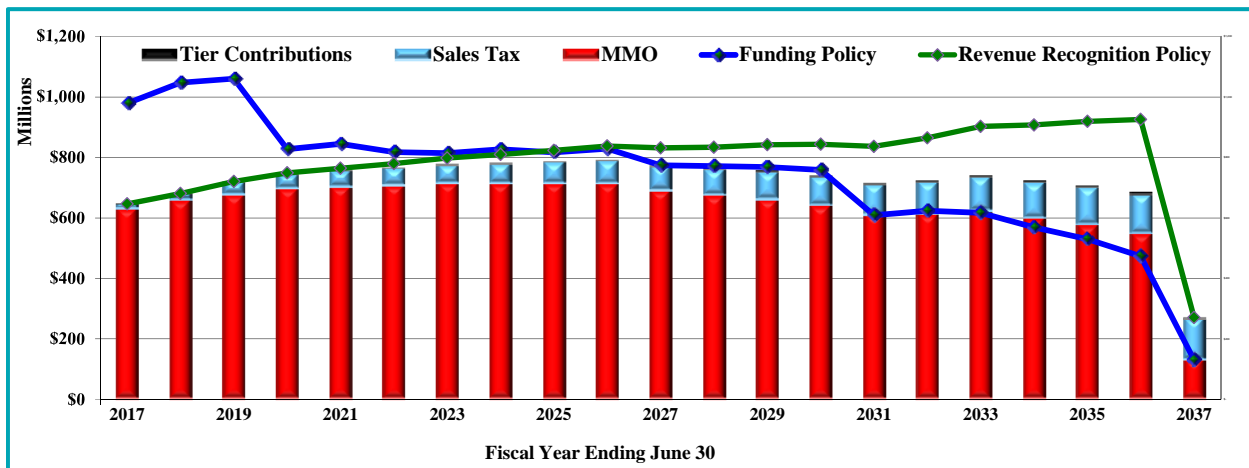


Chart 4B continues to show the impact of negative cash flows on future contributions. Contributions are higher as compared to Chart 3B.

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Chart 5B: Projection of City Contributions, 7.70% return each year, and the City makes contributions based on the City’s Funding Policy

This chart shows the expected future contribution if the City’s Funding Policy contributions are made each year. Though under this scenario significantly larger contributions are assumed to be made each year up front, projected contributions are expected to decline more rapidly when the initial funded base is expected to be paid off in 2019 when compared to Chart 1B.

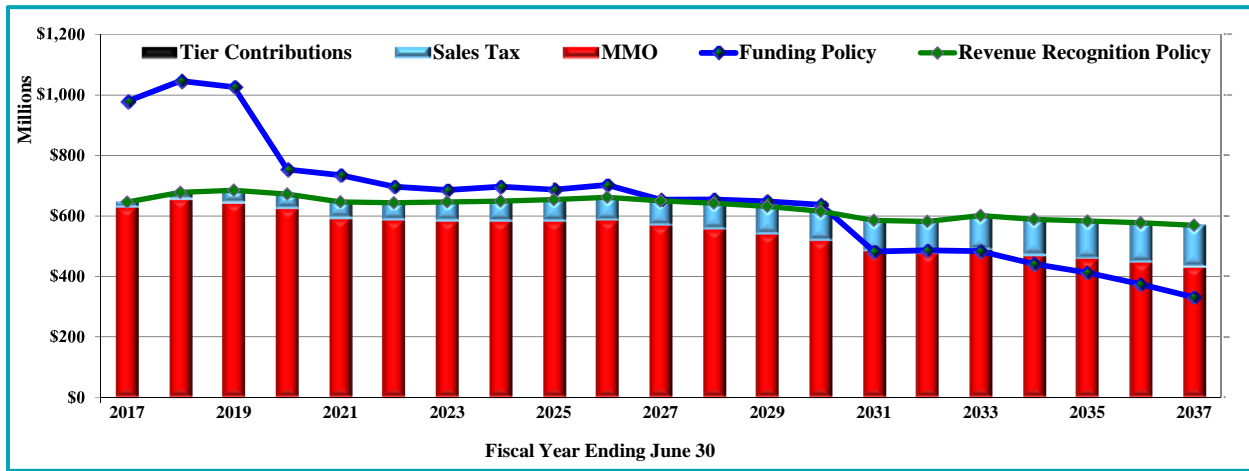
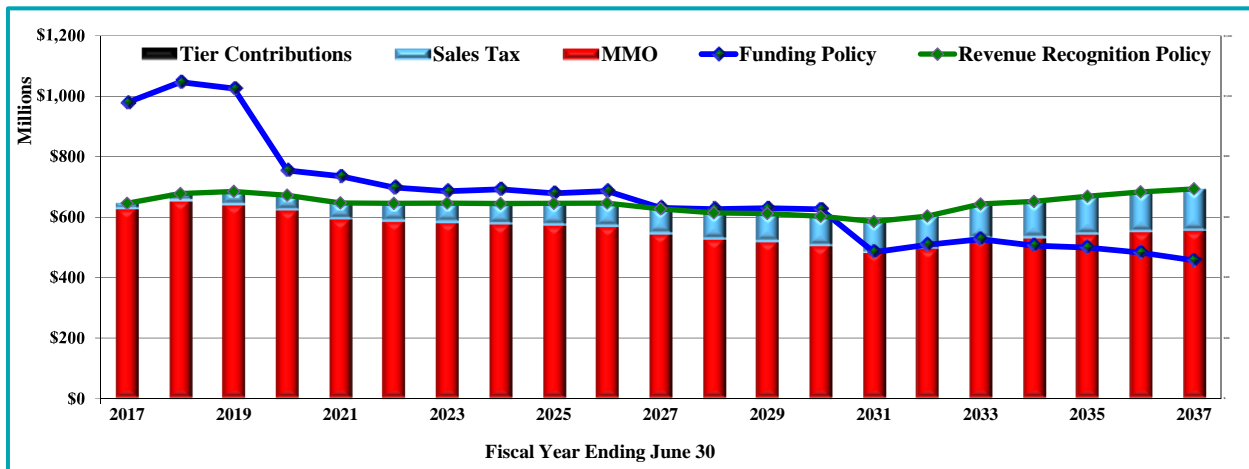


Chart 6B: Projection of City Contributions, varying returns averaging 7.70% and the City makes contributions based on the City’s Funding Policy

Chart 6B is similar to Chart 5B, illustrating again the smoothing expectation on a City Funding Policy level when the annual return rates vary from year to year.



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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, 2015 and July 1, 2016,
- 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, 2016,
- 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 II-1 on the following page presents the market value by asset class as of July 1, 2015 and July 1, 2016. Table II-2 presents the System's net cash flows for the plan year beginning July 1, 2015 and ending June 30, 2016. Table II-3 presents Fiscal 2016 City contributions.

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Table II-1		
Statement of Assets at Market Value*		
	7/1/2016	7/1/2015**
<u>Assets</u>		
Cash	\$ 25,666,811	\$ 124,032,000
Investments	4,343,555,182	4,539,851,000
Securities Lending	330,983,374	405,678,000
Accrued Interest and Other Receivables	130,766,974	132,196,000
Due from Other Governmental Units	<u>9,199,136</u>	<u>4,282,000</u>
Total Assets	\$ 4,840,171,476	\$ 5,206,039,000
<u>Liabilities</u>		
Due on Securities Lending	\$ 330,983,374	\$ 405,964,000
Accrued Expenses and Other Liabilities	<u>151,213,029</u>	<u>125,823,000</u>
Total Liabilities	\$ 482,196,403	\$ 531,787,000
Net Assets	\$ 4,357,975,073	\$ 4,674,252,000

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

** Prior year values were rounded values based on the financial statements provided to us.

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SECTION II - ASSETS

B. System Cash Flows for the Year July 1, 2015 through July 1, 2016

Table II-2 Changes in Market Values¹		
Value of Assets – July 1, 2015		\$ 4,674,252,000
<u>Additions</u>		
Contributions:		
Employer Contributions	\$ 660,246,511	
Employee Contributions	67,055,003	
Total Contributions		\$ 727,301,514
Investment Income:		
Appreciation in FV of Investments	\$ (239,840,016)	
Interest and Dividends	101,505,337	
Total Investment Income	\$ (138,334,679)	
Investment Activity Expenses:		
Investment Expenses	(9,089,004)	
Total Investment Activity Expenses	\$ (9,089,004)	
Securities Lending Activities:		
Securities Lending Income	\$ 1,920,756	
Securities Lending Expenses	(313,070)	
Net Income from Securities Lending Activities	\$ 1,607,686	
Miscellaneous Operating Revenues	\$ 134,517	
Net Investment Income		(145,681,480)
Total Additions		\$ 581,620,034
<u>Deductions</u>		
Administrative Expenses	\$ (8,553,837)	
Withdrawal Refunds	(7,351,066)	
Benefit Payments	(851,987,767)	
PAF Distributions	(30,004,291)	
Total Deductions		(897,896,961)
<u>Total</u>		
Net Increase (Decrease)		(316,276,927)
Value of Assets – July 1, 2016		\$ 4,357,975,073

¹ Includes the PAF which is not available for funding purposes

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Table II-3		
City Contributions for the Plan Year Ending June 30, 2016		
Cash Received from City during Fiscal Year 2016	\$	629,238,802
Cash Received from Quasi-Agencies		<u>31,007,709</u>
Total Cash Received during Fiscal Year 2016	\$	660,246,511

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SECTION II - 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 (over a five year period prior to 2009) coupled with the requirement that the resulting asset value may not be more or less than 20% of the MVA.

Table II-4 Development of Actuarial Value of Assets as of July 1, 2016				
1. Market Value of Assets as of July 1, 2016				\$ 4,357,975,073
2. Pension Adjustment Fund (PAF) as of July 1, 2016 Before Additional Transfers				\$ 7,222,828
3. Market Value of Assets Net of Original PAF*				\$ 4,350,752,245
4. Deferred Asset Gains/(Losses)				
Fiscal Year	Investment	Percent	Percent	Amount
<u>Ending</u>	<u>Gains / (Losses)</u>	<u>Recognized</u>	<u>Deferred</u>	<u>Deferred</u>
2009	\$ (1,235,073,412)	80%	20%	\$ (247,014,682)
2010	200,524,637	70%	30%	60,157,391
2011	414,187,915	60%	40%	165,675,166
2012	(328,486,968)	50%	50%	(164,243,484)
2013	127,718,278	40%	60%	76,630,967
2014	347,082,935	30%	70%	242,958,055
2015	(349,020,722)	20%	80%	(279,216,577)
2016	(489,127,035)	10%	90%	(440,214,332)
Total				\$ (585,267,496)
5. Preliminary Actuarial Value as of July 1, 2016 (5 = 3 - 4)				\$ 4,936,019,741
6. Corridor for Actuarial Value				
a. 80% of Market Value Net of PAF				\$ 3,480,601,796
b. 120% of Market Value Net of PAF				\$ 5,220,902,694
7. Additional PAF Transfer as of July 1, 2016				\$ 0
8. Actuarial Value of Assets Net of Final PAF as of July 1, 2016				\$ 4,936,019,741
8 = max((min of 5 or 6b) and 6a), minus 7				
9. As a percent of Market Value Net of Final PAF				113.5%
10. Market Value of Assets Net of Final PAF				\$ 4,350,752,245

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

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SECTION II - 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.

Table II-5 Allocation of Assets for Valuation Purposes Between Plans as of July 1, 2016 (\$ thousands)									
	1967 Plan			1987 Plan				Plan '10	Total
	Municipal	Police	Fire	Municipal	Elected	Police	Fire	Municipal	
1. Actuarial Value of Assets as of July 1, 2015	\$ 1,517,497	\$ 633,232	\$ 212,502	\$ 1,126,041	\$ 11,938	\$ 1,067,234	\$ 294,687	\$ 283	\$ 4,863,413
2. Transactions During Plan Year July 1, 2015 to June 30, 2016									
a. Contributions									
City and Commonwealth Employees	\$ 282,500	\$ 147,663	\$ 63,042	\$ 71,053	\$ 1,142	\$ 47,346	\$ 16,198	\$ 295	\$ 629,239
Quasi-Public Agencies	5,773	2,008	741	27,195	333	21,733	8,413	859	67,055
b. Benefit Payments	25,995	0	0	5,013	0	0	0	0	31,008
c. Withdrawals	(441,449)	(240,201)	(92,905)	(42,227)	(1,531)	(27,147)	(6,526)	0	(851,988)
d. Administrative Expenses	(886)	(196)	(174)	(2,841)	(41)	(2,524)	(690)	0	(7,351)
e. Net Transactions	(2,928)	(1,248)	(427)	(2,752)	(6)	(855)	(295)	(44)	(8,554)
3. Total Fund Balance Prior to Allocation of Investment Income [1. + 2e.]	\$ (130,995)	\$ (91,974)	\$ (29,723)	\$ 55,441	\$ (103)	\$ 38,553	\$ 17,100	\$ 1,110	\$ (140,591)
4. Investment Income During Plan Year July 1, 2015 to June 30, 2016	\$ 1,386,502	\$ 541,258	\$ 182,779	\$ 1,181,482	\$ 11,835	\$ 1,105,787	\$ 311,787	\$ 1,393	\$ 4,722,822
5. Preliminary Actuarial Value of Assets as of July 1, 2016 [3. + 4.]	\$ 62,589	\$ 24,433	\$ 8,251	\$ 53,335	\$ 534	\$ 49,917	\$ 14,075	\$ 63	\$ 213,197
6. Allocation of PAF Transfer	\$ 1,449,091	\$ 565,691	\$ 191,031	\$ 1,234,817	\$ 12,369	\$ 1,155,704	\$ 325,861	\$ 1,456	\$ 4,936,020
7. Final Actuarial Value of Assets With Corridor as of July 1, 2016	\$ 0	\$ 0	\$ 0	\$ 0	\$ 0	\$ 0	\$ 0	\$ 0	\$ 0
	\$ 1,449,091	\$ 565,691	\$ 191,031	\$ 1,234,817	\$ 12,369	\$ 1,155,704	\$ 325,861	\$ 1,456	\$ 4,936,020

Note: Numbers may not add due to rounding

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E. Development of the Pension Adjustment Fund as of July 1, 2016

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.

Table II-6 Development of the Pension Adjustment Fund as of July 1, 2016		
1.	PAF on July 1, 2015	\$ 38,198,762
2.	PAF Distribution	(30,004,291)
3.	Market Value Asset Return Through June 30, 2016 *	-3.17%
4.	PAF on July 1, 2016 Before Additional Transfers** =(1) x [1 + (3)] + (2)	\$ 7,222,828
5.	Adjusted Market Value of Assets Through June 30, 2016	\$ 4,787,089,476
6.	Adjusted Market Value of Assets Return Through June 30, 2016 ***	4.43%
7.	Return in Excess of Investment Assumption Plus 1.0%, Limited to 5.0% =(6) - [7.75% + 1.00%]	0.00%
8.	Additional Transfer as of July 1, 2016 =50% of (7) x (5)	\$ 0
9.	Total PAF as of July 1, 2016 = (4) + (8)	\$ 7,222,828

* 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

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F. Actuarial Value of Assets for Revenue Recognition Policy

The System is expected to receive additional revenue from sales tax and tier 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.

Table II-7 Actuarial Value of Assets for Revenue Recognition Policy as of July 1, 2016		
1.	Additional Revenue Account on July 1, 2015	\$0
2.	Sales Tax Revenue Received During FYE June 30, 2016	9,691,425
3.	Tier Member Contributions Received During FYE June 30, 2016	0
4.	Market Value Asset Return Through June 30, 2016	-3.17%
5.	Additional Revenue Account on July 1, 2016* =(1) x [1 + (4)] + [(2) + (3)] x [1 + (4)]^0.5	\$9,536,352
6.	Actuarial Value of Assets on June 30, 2016	\$4,936,019,740
7.	Actuarial Value of Assets Net of Additional Revenue on June 30, 2016** =(6) - (5)	\$4,926,483,388

* Additional City contributions from sales tax revenue and tier member contributions are assumed to be received mid-year

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

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SECTION II - ASSETS

G. Investment Performance

The market value of assets internal rate of return was -3.17% for the year ending June 30, 2016. This is compared to an assumed return of 7.75% for the same period. This return produced an overall investment loss of \$489.1 million for the year ending June 30, 2016. On an actuarial value of assets basis (net of PAF), the return for FYE 2016 was 4.45%. In the table below, we also provide returns from two broad asset classes for comparison.

Table II-8					
Annual Rates of Return					
Year Ending	Investment	Market	Actuarial	Total Return	Barclays
June 30,	Return	Value	Value *	Standard & Poor's	Aggregate
	Assumption			500 Index	Bond Index**
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%

* Net of PAF

** Formerly Lehman Brothers Aggregate Bond Index

**CITY OF PHILADELPHIA MUNICIPAL RETIREMENT SYSTEM
JULY 1, 2016 ACTUARIAL VALUATION**

SECTION II - ASSETS

H. Asset Gain/(Loss)

There was a \$489.1 million investment loss on market value of assets when compared to the expected as of July 1, 2016. Table II-9 reconciles the 2016 asset loss (expected versus actual) for the market value of assets both net of the PAF and in total. This investment loss is smoothed over a ten-year period to determine the actuarial value of assets (see Table II – 4). Also provided below is a reconciliation of the PAF.

Table II-9 Calculation of Asset Gain/(Loss)			
	Market Value (Net of PAF)	PAF	Total Market Value
1. Market Value of Assets as of July 1, 2015	\$ 4,636,053,238	\$ 38,198,762	\$ 4,674,252,000
2. Transactions During Plan Year July 1, 2015 to June 30, 2016			
a. Contributions			
City and Commonwealth Employees Quasi-Public Agencies	\$ 629,238,802 67,055,003 31,007,709	\$ 0 0 0	\$ 629,238,802 67,055,003 31,007,709
b. Benefit Payments	(851,987,767)	(30,004,291)	(881,992,058)
c. Withdrawals	(7,351,066)	0	(7,351,066)
d. Administrative Expenses	(8,553,837)	0	(8,553,837)
e. Net Transactions	\$ (140,591,156)	\$ (30,004,291)	\$ (170,595,447)
3. Expected Investment Income from July 1, 2015 to June 30, 2016	\$ 344,417,198	\$ (971,644) *	\$ 343,445,554
4. PAF transfer at July 1, 2016	\$ 0	\$ 0	\$ 0
5. Expected Market Value of Assets as of July 1, 2016 [1. + 2.e. + 3. + 4]	\$ 4,839,879,280	\$ 7,222,828	\$ 4,847,102,107
6. Market Value of Assets as of July 1, 2016	\$ 4,350,752,245	\$ 7,222,828	\$ 4,357,975,073
7. Investment Gain/(Loss) [6. - 5.]	\$ (489,127,035)	\$ 0	\$ (489,127,035)

* 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, 2016 ACTUARIAL VALUATION**

SECTION III - 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, 2015 and July 1, 2016,
- 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, 2017.

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
JULY 1, 2016 ACTUARIAL VALUATION**

SECTION III - LIABILITIES

Table III-1 shows the present value of future benefits, actuarial liability, and unfunded actuarial liability as of July 1, 2016, and July 1, 2015, for the Retirement System.

Table III-1 Disclosure of Liabilities (\$ thousands)		
	July 1, 2016	July 1, 2015
Present Value of Future Benefits		
Actives	\$ 4,950,643	\$ 4,724,148
Terminated Vesteds	120,291	126,357
Disabled	750,685	726,996
Retirees	5,029,339	4,896,290
Beneficiaries	635,323	616,393
DROP Account plus Deferred Annuities	722,743	828,281
Non-Vested Refunds	7,334	6,739
Total City PVFB	\$ 12,216,358	\$ 11,925,204
Market Value of Assets (Net of PAF)	(4,350,752)	(4,636,053)
Present Value Future Member Contrib.	(504,926)	(444,911)
City's Unfunded Future Obligation	\$ 7,360,680	\$ 6,844,240
Actuarial Liability		
Actives	\$ 3,759,083	\$ 3,599,336
Terminated Vesteds	120,291	126,357
Disabled	750,685	726,996
Retirees	5,029,339	4,896,290
Beneficiaries	635,323	616,393
DROP	722,743	828,281
Non-Vested Refunds	7,334	6,739
Total City AL	\$ 11,024,798	\$ 10,800,392
Actuarial Value of Assets	(4,936,020)	(4,863,413)
Unfunded Actuarial Liability	\$ 6,088,778	\$ 5,936,979

**CITY OF PHILADELPHIA MUNICIPAL RETIREMENT SYSTEM
JULY 1, 2016 ACTUARIAL VALUATION**

SECTION III - LIABILITIES

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

Table III-2 Liabilities Detail as of July 1, 2016 (\$ thousands)									
	1967 Plan			1987 Plan				Plan '10	Total
	Municipal	Police	Fire	Municipal	Elected	Police	Fire	Municipal	
Present Value of Future Benefits									
Actives	\$ 764,757	\$ 240,446	\$ 73,539	\$ 1,708,930	\$ 18,389	\$ 1,602,191	\$ 528,061	\$ 14,330	\$ 4,950,643
Terminated Vesteds	46,801	145	0	55,252	0	15,576	2,517	0	120,291
Disabled	230,601	197,062	47,851	81,905	0	164,268	28,999	0	750,685
Retirees	2,712,885	1,336,257	603,564	242,529	11,476	90,544	32,084	0	5,029,339
Beneficiaries	332,151	169,823	73,231	30,657	677	21,270	7,513	0	635,323
DROP	361,771	156,609	47,627	81,990	0	60,071	14,674	0	722,743
Non-Vested Refunds	1,644	155	50	4,585	10	724	166	0	7,334
Total PVFB	\$ 4,450,610	\$ 2,100,497	\$ 845,862	\$ 2,205,848	\$ 30,552	\$ 1,954,644	\$ 614,015	\$ 14,330	\$ 12,216,358
Actuarial Liability									
Actives	\$ 721,933	\$ 223,300	\$ 68,728	\$ 1,313,817	\$ 15,713	\$ 1,090,696	\$ 323,255	\$ 1,641	\$ 3,759,083
Terminated Vesteds	46,801	145	0	55,252	0	15,576	2,517	0	120,291
Disabled	230,601	197,062	47,851	81,905	0	164,268	28,999	0	750,685
Retirees	2,712,885	1,336,257	603,564	242,529	11,476	90,544	32,084	0	5,029,339
Beneficiaries	332,151	169,823	73,231	30,657	677	21,270	7,513	0	635,323
DROP	361,771	156,609	47,627	81,990	0	60,071	14,674	0	722,743
Non-Vested Refunds	1,644	155	50	4,585	10	724	166	0	7,334
Total AL	\$ 4,407,786	\$ 2,083,351	\$ 841,051	\$ 1,810,735	\$ 27,876	\$ 1,443,149	\$ 409,209	\$ 1,641	\$ 11,024,798
Actuarial Value of Assets	(1,449,091)	(565,691)	(191,031)	(1,234,817)	(12,369)	(1,155,704)	(325,861)	(1,456)	(4,936,020)
Unfunded Actuarial Liability	\$ 2,958,695	\$ 1,517,660	\$ 650,020	\$ 575,918	\$ 15,507	\$ 287,445	\$ 83,349	\$ 185	\$ 6,088,778
Funding Percent	32.9%	27.2%	22.7%	68.2%	44.4%	80.1%	79.6%	88.7%	44.8%

Note: Numbers may not add due to rounding.

**CITY OF PHILADELPHIA MUNICIPAL RETIREMENT SYSTEM
JULY 1, 2016 ACTUARIAL VALUATION**

SECTION III - LIABILITIES

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

Table III-3									
Derivation of the Normal Cost as of July 1, 2016									
(\$ thousands)									
	1967 Plan			1987 Plan				Plan '10	Total
	Municipal	Police	Fire	Municipal	Elected	Police	Fire	Municipal	
Retirement	\$ 6,870	\$ 4,086	\$ 1,229	\$ 29,907	\$ 249	\$ 37,884	\$ 14,916	\$ 757	\$ 95,898
Death	212	111	35	1,464	11	1,638	665	48	4,185
Disability	859	620	175	5,910	34	7,680	2,807	223	18,308
Termination	3,505	379	109	22,112	183	3,802	1,252	606	31,947
Administrative Expenses	2,916	1,256	430	2,874	7	895	333	124	8,836
Total Normal Cost (with Expenses)	\$ 14,363	\$ 6,452	\$ 1,977	\$ 62,268	\$ 483	\$ 51,899	\$ 19,974	\$ 1,757	\$ 159,174
Expected Employee Contributions	\$ 5,587	\$ 1,843	\$ 564	\$ 28,295	\$ 336	\$ 21,508	\$ 8,164	\$ 1,229	\$ 67,526
City Normal Cost	\$ 8,777	\$ 4,609	\$ 1,413	\$ 33,973	\$ 148	\$ 30,390	\$ 11,809	\$ 528	\$ 91,647
Current Annual Payroll	\$ 117,619	\$ 30,725	\$ 9,403	\$ 901,112	\$ 3,549	\$ 419,267	\$ 155,216	\$ 39,660	\$ 1,676,549
City Normal Cost as % of Pay, Beginning of Year Payment	7.462%	15.000%	15.028%	3.770%	4.164%	7.248%	7.608%	1.331%	5.466%
City Normal Cost as % of Pay, End of Year Payment	8.036%	16.155%	16.185%	4.060%	4.485%	7.807%	8.194%	1.434%	5.887%

Note: Numbers may not add due to rounding.

**CITY OF PHILADELPHIA MUNICIPAL RETIREMENT SYSTEM
JULY 1, 2016 ACTUARIAL VALUATION**

SECTION III - LIABILITIES

Table III-4 shows changes in the unfunded actuarial liability from July 1, 2015 to July 1, 2016 due to actuarial experience and assumption changes. The plan changes made during 2016 had no impact on the UAL as they were adopted after the beginning of the plan year and affect future new members and future member contributions for DC 33. It also shows the development of the expected unfunded actuarial liability from July 1, 2016 to July 1, 2017 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 IV – 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 III-4 Expected Unfunded Actuarial Liability for the Plan Year Ending June 30, 2017 (\$ thousands)									
	1967 Plan			1987 Plan				Plan '10	Total
	Municipal	Police	Fire	Municipal	Elected	Police	Fire	Municipal	
1. Expected Unfunded Actuarial Liability (UAL) as of July 1, 2016 Based on July 1, 2015 Valuation*	\$ 2,733,183	\$ 1,382,529	\$ 595,689	\$ 482,774	\$ 12,461	\$ 225,898	\$ 70,171	\$ 40	\$ 5,502,745
2. Changes in UAL due to									
a. Actuarial Experience	\$ 209,155	\$ 127,697	\$ 51,399	\$ 81,106	\$ 2,928	\$ 51,965	\$ 10,470	\$ 133	\$ 534,853
b. Assumption Changes	16,357	7,433	2,932	12,038	119	9,582	2,709	13	51,181
c. Active Plan Changes	0	0	0	0	0	0	0	0	0
d. Inactive Plan Changes	0	0	0	0	0	0	0	0	0
e. Subtotal	\$ 225,512	\$ 135,130	\$ 54,331	\$ 93,144	\$ 3,047	\$ 61,547	\$ 13,178	\$ 145	\$ 586,034
3. Actual UAL as of July 1, 2016 [1. + 2e.]	\$ 2,958,695	\$ 1,517,659	\$ 650,020	\$ 575,918	\$ 15,508	\$ 287,444	\$ 83,349	\$ 185	\$ 6,088,778
4. Expected Changes in UAL from July 1, 2016 to July 1, 2017 due to									
a. Interest on Changes in UAL	\$ 17,364	\$ 10,405	\$ 4,183	\$ 7,172	\$ 235	\$ 4,739	\$ 1,015	\$ 11	\$ 45,125
b. FY 2017 Amortization Contribution	(279,527)	(142,801)	(62,873)	(26,423)	(892)	(14,818)	(4,293)	(1)	(531,628)
c. Subtotal	\$ (262,162)	\$ (132,396)	\$ (58,690)	\$ (19,251)	\$ (657)	\$ (10,079)	\$ (3,279)	\$ 10	\$ (486,503)
5. Expected UAL as of July 1, 2017 [3. + 4c.]	\$ 2,696,533	\$ 1,385,263	\$ 591,330	\$ 556,667	\$ 14,851	\$ 277,365	\$ 80,070	\$ 195	\$ 5,602,275

* 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, 2016 ACTUARIAL VALUATION**

SECTION IV - 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 contribution 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, predictable and 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 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 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, 2016 ACTUARIAL VALUATION**

SECTION IV - CONTRIBUTIONS AND MINIMUM MUNICIPAL OBLIGATION

In Table IV-1 we provide the employee contribution rates as a percent of pay effective for the plan year starting July 1, 2017. 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 10 participants eligible for accelerated vesting.

Table IV-1 Employee Contribution Rates for the Plan Year Beginning July 1, 2017				
	Municipal¹	Elected²	Police	Fire
Plan 67	7.00%	N/A	6.00%	6.00%
Plan 67- 50% of Aggregate NC ³	6.11%	N/A	N/A	N/A
Plan 87	3.14%	9.46%	5.00%	5.00%
Plan 87- 50% of Aggregate NC ⁴	3.46%	N/A	N/A	N/A
Plan 87 - Accelerated Vesting ⁵	4.60%	12.38%	N/A	N/A
Plan 87 Prime ⁶	4.14%	10.46%	6.00%	6.00%
Plan '10 ⁷	3.10%	N/A	5.50%	5.50%
Plan '10 - Accelerated Vesting	3.28%	N/A	N/A	N/A
Plan '16	4.14%	N/A	N/A	N/A

¹For 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 6% above it.

²The employee contribution rate is based upon the normal cost of \$483,475 under Plan 87 Elected, normal cost of \$261,961 under Plan 87 Municipal and current annual payroll of \$3,548,609.

³Effective November 2014 guards represented by DC 33 contribute at 50% of the aggregate Normal Cost of all members in Plan J.

⁴This represents 50% of Aggregate Normal Cost for all members in Plan Y.

⁵Member 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.

⁶Plan 87 Prime refers to new hires who have the option to elect Plan '10 but have elected to stay in Plan '87.

⁷There were 932 participants in Plan '10 Municipal as of the valuation date. Because this group is relatively small the employee contribution rate is phased in over 10 years beginning in 2012 with the employee contribution rate calculated for new entrants in Plan '87 Prime.

**CITY OF PHILADELPHIA MUNICIPAL RETIREMENT SYSTEM
JULY 1, 2016 ACTUARIAL VALUATION**

SECTION IV - CONTRIBUTIONS AND MINIMUM MUNICIPAL OBLIGATION

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

Table IV-2a		
Quasi Agency Funding Rate as a		
Percent of Payroll (Based on Funding Policy)		
Valuation Date	July 1, 2016	July 1, 2015
Fiscal Year Ending in Year	2018	2017
67 Municipal		
1. Normal Cost Rate	8.036%	7.701%
2. Amortization Rate under the City's Funding Policy	<u>439.827%</u>	<u>370.894%</u>
3. Total Year-End Rate [1. + 2.]	447.863%	378.595%
4. Quarterly adjustment factor	0.97236	0.97219
5. Total, adjusted for Quarterly Payments [3. x 4.]	435.483%	368.065%
87 Municipal		
1. Normal Cost Rate	4.060%	4.007%
2. Amortization Rate under the City's Funding Policy	<u>8.242%</u>	<u>7.402%</u>
3. Total Year-End Rate [1. + 2.]	12.302%	11.410%
4. Quarterly adjustment factor	0.97236	0.97219
5. Total, adjusted for Quarterly Payments [3. x 4.]	11.962%	11.092%
Plan 10 Municipal		
1. Normal Cost Rate	1.434%	1.252%
2. Amortization Rate under the City's Funding Policy	<u>0.050%</u>	<u>0.030%</u>
3. Total Year-End Rate [1. + 2.]	1.484%	1.282%
4. Quarterly adjustment factor	0.97236	0.97219
5. Total, adjusted for Quarterly Payments [3. x 4.]	1.443%	1.246%

**CITY OF PHILADELPHIA MUNICIPAL RETIREMENT SYSTEM
JULY 1, 2016 ACTUARIAL VALUATION**

SECTION IV - CONTRIBUTIONS AND MINIMUM MUNICIPAL OBLIGATION

Table IV-2b		
Quasi Agency Funding Rate as a Percent of Payroll (Based on MMO)		
Valuation Date	July 1, 2016	July 1, 2015
Fiscal Year Ending in Year	2018	2017
67 Municipal		
1. Normal Cost Rate	8.036%	7.701%
2. Amortization Rate under MMO	<u>252.262%</u>	<u>220.640%</u>
3. Total Year-End Rate [1. + 2.]	260.299%	228.342%
4. Quarterly adjustment factor	0.97236	0.97219
5. Total, adjusted for Quarterly Payments [3. x 4.]	253.103%	221.990%
87 Municipal		
1. Normal Cost Rate	4.060%	4.007%
2. Amortization Rate under MMO*	<u>6.409%</u>	<u>5.684%</u>
3. Total Year-End Rate [1. + 2.]	10.470%	9.691%
4. Quarterly adjustment factor	0.97236	0.97219
5. Total, adjusted for Quarterly Payments [3. x 4.]	10.180%	9.422%
Plan 10 Municipal		
1. Normal Cost Rate	1.434%	1.252%
2. Amortization Rate under MMO*	<u>0.047%</u>	<u>0.027%</u>
3. Total Year-End Rate [1. + 2.]	1.481%	1.278%
4. Quarterly adjustment factor	0.97236	0.97219
5. Total, adjusted for Quarterly Payments [3. x 4.]	1.440%	1.243%

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

**CITY OF PHILADELPHIA MUNICIPAL RETIREMENT SYSTEM
JULY 1, 2016 ACTUARIAL VALUATION**

SECTION IV - CONTRIBUTIONS AND MINIMUM MUNICIPAL OBLIGATION

Table IV-3a shows the development of the FYE 2017 Minimum Municipal Obligation (MMO) and Table IV-3b shows the Revenue Recognition Policy (RRP) for each division. Table IV-4 on the following page shows a schedule of amortization payments toward the MMO.

Table IV-3a				
Development of the Minimum Municipal Obligation for Fiscal Year End 2018				
(\$ thousands)				
	Non-Uniformed	Police	Fire	Total
Estimated FY 2017-2018 Payroll	\$ 1,096,982	\$ 464,842	\$ 170,051	\$ 1,731,875
Normal Cost %	6.870%	12.489%	12.871%	8.967%
Normal Cost	\$ 75,357	\$ 58,055	\$ 21,887	\$ 155,299
Amortization Payment	330,581	164,782	67,799	563,161
Administrative Expenses	6,117	2,222	789	9,128
Subtotal	\$ 412,055	\$ 225,059	\$ 90,475	\$ 727,588
Expected Employee Contributions	(36,617)	(24,123)	(9,017)	(69,756)
Minimum Municipal Obligation	\$ 375,439	\$ 200,936	\$ 81,457	\$ 657,832

Note: Numbers may not add due to rounding.

Table IV-3b				
Development of the Revenue Recognition Policy for Fiscal Year End 2018				
(\$ thousands)				
	Non-Uniformed	Police	Fire	Total
Estimated FY 2017-2018 Payroll	\$ 1,096,982	\$ 464,842	\$ 170,051	\$ 1,731,875
Normal Cost %	6.870%	12.489%	12.871%	8.967%
Normal Cost	\$ 75,357	\$ 58,055	\$ 21,887	\$ 155,299
Amortization Payment	331,063	165,089	67,891	564,043
Administrative Expenses	6,117	2,222	789	9,128
Subtotal	\$ 412,537	\$ 225,366	\$ 90,567	\$ 728,470
Expected Employee Contributions	(36,617)	(24,123)	(9,017)	(69,756)
Revenue Recognition Policy	\$ 375,921	\$ 201,243	\$ 81,550	\$ 658,714

Note: Numbers may not add due to rounding.

**CITY OF PHILADELPHIA MUNICIPAL RETIREMENT SYSTEM
JULY 1, 2016 ACTUARIAL VALUATION**

SECTION IV - CONTRIBUTIONS AND MINIMUM MUNICIPAL OBLIGATION

Table IV-4 Unfunded Liability Payments toward the MMO for Fiscal Year 2018 (\$ thousands)												
Type of Base	Municipal			Police			Fire			Total		
	7/1/2016 Balance	Years Left	FY 2018 Payment	7/1/2016 Balance	Years Left	FY 2018 Payment	7/1/2016 Balance	Years Left	FY 2018 Payment	7/1/2016 Balance	Years Left	FY 2018 Payment
Fresh Start Base												
est. July 1, 2009	\$ 2,550,288	23	\$ 222,783	\$ 1,435,518	23	\$ 125,401	\$ 556,290	23	\$ 48,595	\$ 4,542,096	23	\$ 396,779
Gain/Loss Base												
est. July 1, 2010	\$ (50,507)	14	\$ (5,590)	\$ (36,015)	14	\$ (3,986)	\$ (2,696)	14	\$ (298)	\$ (89,218)	14	\$ (9,874)
Assumption Change												
est. July 1, 2010	\$ 62,348	9	\$ 9,152	\$ 25,017	9	\$ 3,672	\$ 22,831	9	\$ 3,351	\$ 110,196	9	\$ 16,175
Gain/Loss												
est. July 1, 2011	\$ (99,992)	15	\$ (10,649)	\$ (20,262)	15	\$ (2,158)	\$ (19,925)	15	\$ (2,122)	\$ (140,178)	15	\$ (14,929)
Assumption Change												
est. July 1, 2011	\$ 18,335	10	\$ 2,503	\$ 11,024	10	\$ 1,505	\$ 3,718	10	\$ 507	\$ 33,077	10	\$ 4,515
Gain/Loss												
est. July 1, 2012	\$ 139,237	16	\$ 14,327	\$ 73,642	16	\$ 7,577	\$ 19,071	16	\$ 1,962	\$ 231,950	16	\$ 23,867
Assumption Change												
est. July 1, 2012	\$ 50,990	11	\$ 6,536	\$ 29,131	11	\$ 3,734	\$ 10,179	11	\$ 1,305	\$ 90,300	11	\$ 11,574
Gain/Loss												
est. July 1, 2013	\$ 124,252	17	\$ 12,396	\$ 36,194	17	\$ 3,611	\$ (5,108)	17	\$ (510)	\$ 155,338	17	\$ 15,497
Assumption Change												
est. July 1, 2013	\$ 69,854	12	\$ 8,473	\$ 41,889	12	\$ 5,081	\$ 13,972	12	\$ 1,695	\$ 125,715	12	\$ 15,249
Gain/Loss												
est. July 1, 2014	\$ 101,124	18	\$ 9,811	\$ 41,415	18	\$ 4,018	\$ 48,067	18	\$ 4,663	\$ 190,606	18	\$ 18,493
Assumption Change												
est. July 1, 2014	\$ 240,488	13	\$ 27,787	\$ (8,423)	13	\$ (973)	\$ 9,672	13	\$ 1,118	\$ 241,737	13	\$ 27,931
Gain/Loss												
est. July 1, 2015	\$ 170,616	19	\$ 16,141	\$ 38,740	19	\$ 3,665	\$ 37,329	19	\$ 3,532	\$ 246,685	19	\$ 23,338
Assumption Change												
est. July 1, 2015	\$ 26,824	14	\$ 2,969	\$ 38,765	14	\$ 4,290	\$ 12,377	14	\$ 1,370	\$ 77,966	14	\$ 8,629
Gain/Loss												
est. July 1, 2016	\$ 117,923	20	\$ 10,904	\$ 81,455	20	\$ 7,532	\$ 21,953	20	\$ 2,030	\$ 221,331	20	\$ 20,466
Assumption Change												
est. July 1, 2016	\$ 28,526	15	\$ 3,038	\$ 17,015	15	\$ 1,812	\$ 5,640	15	\$ 601	\$ 51,181	15	\$ 5,451
Total	\$ 3,550,306		\$ 330,581	\$ 1,805,104		\$ 164,782	\$ 733,370		\$ 67,799	\$ 6,088,780		\$ 563,161

Note: Numbers may not add due to rounding.

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Table IV-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, 2016 for the MMO.

Table IV-5a			
Development of the Fiscal Year 2018 Amortization Payment under MMO			
Municipal and Elected			
(\$ thousands)			
	7/1/2016	Remaining	FY 2018
	Outstanding Balance	Years	Payment
1. Expected Unfunded Actuarial Liability (UAL) as of July 1, 2016 Based on July 1, 2015 Valuation	\$ 3,403,857		\$ 316,639
2. Changes in UAL due to			
a. Actuarial Experience	\$ 117,923	20	\$ 10,904
b. Assumption Changes	28,526	15	3,038
c. Active Plan Changes	0	10	0
d. Inactive Plan Changes	0	1	0
e. Subtotal	\$ 146,449		\$ 13,942
3. Total [1c. + 2e.]	\$ 3,550,306		\$ 330,581

Note: Numbers may not add due to rounding.

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Table IV-5b			
Development of the Fiscal Year 2018 Amortization Payment under MMO			
Police			
(\$ thousands)			
	7/1/2016 Outstanding Balance	Remaining Years	FY 2018 Payment
1. Expected Unfunded Actuarial Liability (UAL) as of July 1, 2016 Based on July 1, 2015 Valuation	\$ 1,706,634		\$ 155,437
2. Changes in UAL due to			
a. Actuarial Experience	\$ 81,455	20	\$ 7,532
b. Assumption Changes	17,015	15	1,812
c. Active Plan Changes	0	10	0
d. Inactive Plan Changes	<u>0</u>	<u>1</u>	<u>0</u>
e. Subtotal	\$ 98,470		\$ 9,344
3. Total [1c. + 2e.]	\$ 1,805,104		\$ 164,781

Note: Numbers may not add due to rounding.

Table IV-5c			
Development of the Fiscal Year 2018 Amortization Payment under MMO			
Fire			
(\$ thousands)			
	7/1/2016 Outstanding Balance	Remaining Years	FY 2018 Payment
1. Expected Unfunded Actuarial Liability (UAL) as of July 1, 2016 Based on July 1, 2015 Valuation	\$ 705,776		\$ 65,168
2. Changes in UAL due to			
a. Actuarial Experience	\$ 21,953	20	\$ 2,030
b. Assumption Changes	5,640	15	601
c. Active Plan Changes	0	10	0
d. Inactive Plan Changes	<u>0</u>	<u>1</u>	<u>0</u>
e. Subtotal	\$ 27,593		\$ 2,631
3. Total [1c. + 2e.]	\$ 733,369		\$ 67,799

Note: Numbers may not add due to rounding.

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Table IV-5d			
Development of the Fiscal Year 2018 Amortization Payment under MMO			
Total			
(\$ thousands)			
	7/1/2016	Remaining	FY 2018
	Outstanding Balance	Years	Payment
1. Expected Unfunded Actuarial Liability (UAL) as of July 1, 2016 Based on July 1, 2015 Valuation	\$ 5,816,267		\$ 537,245
2. Changes in UAL due to			
a. Actuarial Experience	\$ 221,331	20	\$ 20,466
b. Assumption Changes	51,181	15	5,451
c. Active Plan Changes	0	10	0
d. Inactive Plan Changes	<u>0</u>	<u>1</u>	<u>0</u>
e. Subtotal	\$ 272,512		\$ 25,917
3. Total [1c. + 2e.]	\$ 6,088,779		\$ 563,162

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

Table IV-6				
Summary of Modified Actuarial Data				
(\$ thousands)				
	Municipal	Police	Fire	Total
Actuarial Liability	\$ 6,248,038	\$ 3,526,499	\$ 1,250,261	\$ 11,024,798
Market Value of Assets (less POB)	\$ 2,099,469	\$ 1,427,704	\$ 347,322	\$ 3,874,495
Actuarial Value of Assets (less POB)	\$ 2,249,009	\$ 1,497,414	\$ 380,696	\$ 4,127,119
Unfunded Actuarial Liability (AL - AVA)	\$ 3,999,029	\$ 2,029,085	\$ 869,565	\$ 6,897,679
Amortization Contributions				
Total Amortization Amount	\$ 370,298	\$ 184,948	\$ 79,955	\$ 635,201
Remaining Years	20	21	20	20

Note: Numbers may not add due to rounding.

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Table IV-7 Modified Unfunded Liability Payments toward the MMO for Fiscal Year 2018 (\$ thousands)												
Type of Base	Municipal			Police			Fire			Total		
	7/1/2016 Balance	Remaining Years	FY 2018 Payment	7/1/2016 Balance	Remaining Years	FY 2018 Payment	7/1/2016 Balance	Remaining Years	FY 2018 Payment	7/1/2016 Balance	Remaining Years	FY 2018 Payment
Fresh Start UAL Base est. July 1, 2009	\$ 2,990,604	23	\$ 261,247	\$ 1,619,862	23	\$ 141,505	\$ 686,245	23	\$ 59,948	\$ 5,296,711	23	\$ 462,699
July 1, 2010 Charges												
Experience (Gain)/Loss	\$ (44,733)	14	\$ (4,951)	\$ (31,292)	14	\$ (3,463)	\$ 1,536	14	\$ 170	\$ (74,489)	14	\$ (8,244)
Assumption Change	62,348	9	9,152	25,017	9	3,672	22,831	9	3,351	110,195	9	16,175
July 1, 2011 Charges												
Experience (Gain)/Loss	\$ (78,231)	15	\$ (8,331)	\$ (7,886)	15	\$ (840)	\$ (10,561)	15	\$ (1,125)	\$ (96,677)	15	\$ (10,296)
Assumption Change	\$ 18,335	10	\$ 2,503	\$ 11,024	10	\$ 1,505	\$ 3,718	10	\$ 507	\$ 33,076	10	\$ 4,515
July 1, 2012 Charges												
Experience (Gain)/Loss	\$ 139,881	16	\$ 14,393	\$ 77,653	16	\$ 7,990	\$ 19,913	16	\$ 2,049	\$ 237,447	16	\$ 24,432
Assumption Change	\$ 50,990	11	\$ 6,536	\$ 29,131	11	\$ 3,734	\$ 10,179	11	\$ 1,305	\$ 90,300	11	\$ 11,574
July 1, 2013 Charges												
Experience (Gain)/Loss	\$ 133,236	17	\$ 13,292	\$ 45,136	17	\$ 4,503	\$ (3,083)	17	\$ (308)	\$ 175,289	17	\$ 17,487
Assumption Change	\$ 69,854	12	\$ 8,473	\$ 41,889	12	\$ 5,081	\$ 13,972	12	\$ 1,695	\$ 125,714	12	\$ 15,249
July 1, 2014 Charges												
Experience (Gain)/Loss	\$ 101,649	18	\$ 9,862	\$ 46,324	18	\$ 4,494	\$ 47,551	18	\$ 4,613	\$ 195,524	18	\$ 18,970
Assumption Change	\$ 240,488	13	\$ 27,787	\$ (8,423)	13	\$ (973)	\$ 9,672	13	\$ 1,118	\$ 241,737	13	\$ 27,931
July 1, 2015 Charges												
Experience (Gain)/Loss	\$ 166,327	19	\$ 15,736	\$ 42,602	19	\$ 4,030	\$ 36,217	19	\$ 3,426	\$ 245,146	19	\$ 23,192
Assumption Change	\$ 26,824	14	\$ 2,969	\$ 38,765	14	\$ 4,290	\$ 12,377	14	\$ 1,370	\$ 77,966	14	\$ 8,629
July 1, 2016 Charges												
Experience (Gain)/Loss	\$ 92,932	20	\$ 8,593	\$ 82,269	20	\$ 7,607	\$ 13,357	20	\$ 1,235	\$ 188,558	20	\$ 17,436
Assumption Change	\$ 28,526	15	\$ 3,038	\$ 17,015	15	\$ 1,812	\$ 5,640	15	\$ 601	\$ 51,181	15	\$ 5,451
Total	\$ 3,999,029		\$ 370,298	\$ 2,029,085		\$ 184,948	\$ 869,565		\$ 79,955	\$ 6,897,679		\$ 635,202

Note: Numbers may not add due to rounding.



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Table IV-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 IV-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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Table IV-8c				
TOTAL DEBT SERVICE REQUIREMENTS: FIRE				
Plan Year	Required Principal Payment	Required Interest Payment	Premium or Discount Amortized	Principal Balance at Valuation Date
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 IV- 9a provides the receipts and disbursements of assets *excluding* the Bond issue assets and excluding the PAF.

Table IV-9a Receipts and Disbursements Excluding Bond Issue Assets				
	Municipal	Police	Fire	Total
Assets as of July 1, 2015	\$ 2,198,554,133	\$ 1,519,432,712	\$ 355,789,402	\$ 4,073,776,247
Receipts				
Employer Contributions	\$ 395,356,129	\$ 184,547,793	\$ 86,838,414	\$ 666,742,336
Employee Contributions	34,159,585	23,741,260	9,154,158	67,055,003
State Aid	35,331,882	19,409,049	7,886,761	62,627,692
Supplemental State Assistance	0	0	0	0
Investment Income (includes investment expenses)	(69,227,704)	(47,256,044)	(11,329,376)	(127,813,124)
Other Receipts	<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>
Total Receipts	\$ 395,619,892	\$ 180,442,058	\$ 92,549,957	\$ 668,611,906
Disbursements				
Benefit Payments	\$ 485,207,818	\$ 267,348,709	\$ 99,431,240	\$ 851,987,767
Refund of Contributions	3,767,836	2,719,577	863,651	7,351,064
Administrative Expenses	5,729,472	2,102,243	722,123	8,553,837
PAF Transfer at Year End	0	0	0	0
Other Disbursements	<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>
Total Disbursements	\$ 494,705,126	\$ 272,170,529	\$ 101,017,014	\$ 867,892,668
Assets as of July 1, 2016	\$ 2,099,468,899	\$ 1,427,704,241	\$ 347,322,345	\$ 3,874,495,485

Note: Numbers may not add due to rounding.

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SECTION IV - CONTRIBUTIONS AND MINIMUM MUNICIPAL OBLIGATION

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

Table IV-9b Receipts and Disbursements Including Bond Issue Assets				
	Municipal	Police	Fire	Total
Assets as of July 1, 2015	\$ 2,522,866,574	\$ 1,638,101,840	\$ 475,085,005	\$ 4,636,053,420
Receipts				
Employer Contributions	\$ 350,665,612	\$ 175,599,366	\$ 71,353,842	\$ 597,618,820
Employee Contributions	34,159,585	23,741,260	9,154,158	67,055,003
State Aid	35,331,882	19,409,049	7,886,761	62,627,692
Supplemental State Assistance	0	0	0	0
Investment Income (includes investment expenses)	(78,714,722)	(51,097,940)	(14,897,359)	(144,710,021)
Other Receipts	0	0	0	0
Total Receipts	\$ 341,442,357	\$ 167,651,735	\$ 73,497,402	\$ 582,591,494
Disbursements				
Benefit Payments	\$ 485,207,818	\$ 267,348,709	\$ 99,431,240	\$ 851,987,767
Refund of Contributions	3,767,836	2,719,577	863,651	7,351,064
Administrative Expenses	5,729,472	2,102,243	722,123	8,553,837
PAF Transfer at Year End	0	0	0	0
Other Disbursements	0	0	0	0
Total Disbursements	\$ 494,705,126	\$ 272,170,529	\$ 101,017,014	\$ 867,892,668
Assets as of July 1, 2016	\$ 2,369,603,805	\$ 1,533,583,047	\$ 447,565,394	\$ 4,350,752,245

Note: Numbers may not add due to rounding.

**CITY OF PHILADELPHIA MUNICIPAL RETIREMENT SYSTEM
JULY 1, 2016 ACTUARIAL VALUATION**

SECTION IV - CONTRIBUTIONS AND MINIMUM MUNICIPAL OBLIGATION

The Table IV – 10 and Table IV – 11 provide information on the City’s Funding Policy for FYE 2016 and FYE 2017. 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, 2016 valuation report will determine FYE 2018 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 IV – 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 IV – 11 provides the estimated FYE 2018 and updated FYE 2017 contribution amount under the City’s Funding Policy. The estimated FYE 2018 contribution will be updated in next year’s actuarial valuation report based upon the July 1, 2017 payroll.

**CITY OF PHILADELPHIA MUNICIPAL RETIREMENT SYSTEM
JULY 1, 2016 ACTUARIAL VALUATION**

SECTION IV - CONTRIBUTIONS AND MINIMUM MUNICIPAL OBLIGATION

Table IV-10					
Development of the Fiscal Year 2018 Amortization Payment under the City's Funding Policy					
	Total (\$ thousands)				
	7/1/2016	7/1/2017	Remaining	FY 2018 Payment	FY 2018 Payment
	Outstanding Balance	Expected Balance	Years	Beginning-of-Year	End-of-Year
1. Expected Unfunded Actuarial Liability (UAL) as of July 1, 2016 Based on July 1, 2015 Valuation Remaining	\$ 5,502,744	\$ 4,971,116		\$ 893,487	\$ 962,286
2. Changes in UAL due to					
a. Actuarial Experience	\$ 534,853	\$ 576,036	20	\$ 53,266	\$ 57,367
b. Assumption Changes	51,181	55,122	15	5,870	6,322
c. Active Plan Changes	0	0	10	0	0
d. Inactive Plan Changes	0	0	1	0	0
e. Subtotal	\$ 586,034	\$ 631,158		\$ 59,136	\$ 63,689
3. Total [1c. + 2e.]	\$ 6,088,778	\$ 5,602,274		\$ 952,623	\$ 1,025,975

Table IV-11				
City's Funding Policy Contributions*				
Fiscal Year	2018	% of Pay	2017	% of Pay
Estimated FY Payroll	\$ 1,731,875		\$ 1,676,549	**
Normal Cost (with Expenses)	\$ 164,427	9.49%	\$ 156,769	9.35%
Employee Contributions	<u>(69,756)</u>	4.03%	<u>(66,685)</u>	3.98%
City Normal Cost	\$ 94,671	5.47%	\$ 90,084	5.37%
Amortization Payment	<u>952,623</u>	55.01%	<u>888,426</u>	52.99%
City's Funding Policy	\$ 1,047,294	60.47%	\$ 978,510	58.36%

* Assuming beginning-of-year payment.

** FY 2016 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
JULY 1, 2016 ACTUARIAL VALUATION**

APPENDIX A - MEMBERSHIP INFORMATION

The data for this valuation was provided by the Board of Pensions as of July 1, 2016. Cheiron did not audit any of the data; however, it was reviewed to ensure that it complies with generally accepted actuarial standards. 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-22: Age/Service Distribution for Active Participants, Counts and Average Salary for all Plans
- A-23: Reconciliation of Plan Membership
- A-24 through A-28: Age and Benefit Distributions for Non-Active Member Data

**CITY OF PHILADELPHIA MUNICIPAL RETIREMENT SYSTEM
JULY 1, 2016 ACTUARIAL VALUATION**

APPENDIX A - MEMBERSHIP INFORMATION

**Table A-1
Active Member Data**

	July 1, 2016	July 1, 2015	% Change		July 1, 2016	July 1, 2015	% Change
<u>2010 Municipal</u>				<u>1987 Elected</u>			
Count	932	339	174.9%	Count	26	25	4.0%
Average Age	35.7	34.9	2.1%	Average Age	55.9	57.1	-2.0%
Average Service	1.0	0.6	70.7%	Average Service	20.5	20.3	1.1%
Average Salary	\$ 42,553	\$ 38,880	9.4%	Average Salary	\$ 136,485	\$ 134,221	1.7%
Total Annual Salary	\$ 39,659,529	\$ 13,180,429	200.9%	Total Annual Salary	\$ 3,548,609	\$ 3,355,528	5.8%
<u>1967 Municipal</u>				<u>1987 Municipal</u>			
Count	1,787	2,101	-14.9%	Count	17,358	17,399	-0.2%
Average Age	54.9	54.4	1.0%	Average Age	44.3	44.0	0.7%
Average Service	29.2	28.4	2.6%	Average Service	10.5	10.1	4.2%
Average Salary	\$ 65,819	\$ 63,002	4.5%	Average Salary	\$ 51,913	\$ 49,512	4.9%
Total Annual Salary	\$ 117,618,534	\$ 132,367,095	-11.1%	Total Annual Salary	\$ 901,111,541	\$ 861,458,725	4.6%
<u>1967 Police</u>				<u>1987 Police</u>			
Count	350	402	-12.9%	Count	5,565	5,569	-0.1%
Average Age	55.9	55.2	1.3%	Average Age	41.6	41.1	1.2%
Average Service	30.9	30.2	2.5%	Average Service	15.3	14.7	3.6%
Average Salary	\$ 87,786	\$ 83,761	4.8%	Average Salary	\$ 75,340	\$ 72,673	3.7%
Total Annual Salary	\$ 30,724,988	\$ 33,672,104	-8.8%	Total Annual Salary	\$ 419,266,968	\$ 404,714,324	3.6%
<u>1967 Fire</u>				<u>1987 Fire</u>			
Count	106	127	-16.5%	Count	2,184	1,989	9.8%
Average Age	56.9	56.3	1.0%	Average Age	39.8	40.1	-0.7%
Average Service	31.4	30.6	2.4%	Average Service	11.3	11.6	-2.5%
Average Salary	\$ 88,705	\$ 86,267	2.8%	Average Salary	\$ 71,070	\$ 69,454	2.3%
Total Annual Salary	\$ 9,402,718	\$ 10,955,882	-14.2%	Total Annual Salary	\$ 155,216,075	\$ 138,144,782	12.4%

**CITY OF PHILADELPHIA MUNICIPAL RETIREMENT SYSTEM
JULY 1, 2016 ACTUARIAL VALUATION**

APPENDIX A - MEMBERSHIP INFORMATION

Table A-1			
Active Member Data (continued)			
	July 1, 2016	July 1, 2015	% Change
<u>Total City</u>			
Count	28,308	27,951	1.3%
Average Age	44.0	44.0	0.0%
Average Service	12.7	12.8	-0.5%
Average Salary	\$ 59,225	\$ 57,166	3.6%
Total Annual Salary	\$ 1,676,548,962	\$ 1,597,848,869	4.9%

**CITY OF PHILADELPHIA MUNICIPAL RETIREMENT SYSTEM
JULY 1, 2016 ACTUARIAL VALUATION**

APPENDIX A - MEMBERSHIP INFORMATION

Table A-2 Non-Active Member Data Count							
	July 1, 2016	July 1, 2015	% Change		July 1, 2016	July 1, 2015	% Change
<u>Total City</u>				<u>1987 Municipal Plan</u>			
Retired	22,412	22,245	0.8%	Retired	2,067	1,797	15.0%
Disabled	4,005	4,016	-0.3%	Disabled	452	407	11.1%
Beneficiary	<u>8,567</u>	<u>8,566</u>	0.0%	Beneficiary	<u>384</u>	<u>338</u>	13.6%
In Pay Status Total	34,984	34,827	0.5%	In Pay Status Total	2,903	2,542	14.2%
DROP	1,614	1,784	-9.5%	DROP	440	411	7.1%
Deferred Vested	1,248	1,334	-6.4%	Deferred Vested	819	846	-3.2%
<u>1967 Municipal Plan</u>				<u>1987 Elected Plan</u>			
Retired	12,604	12,784	-1.4%	Retired	20	19	5.3%
Disabled	1,463	1,503	-2.7%	Disabled	0	0	0.0%
Beneficiary	<u>4,957</u>	<u>5,025</u>	-1.4%	Beneficiary	<u>4</u>	<u>4</u>	0.0%
In Pay Status Total	19,024	19,312	-1.5%	In Pay Status Total	24	23	4.3%
DROP	719	788	-8.8%	DROP	0	0	0.0%
Deferred Vested	305	352	-13.4%	Deferred Vested	0	0	0.0%
<u>1967 Police Plan</u>				<u>1987 Police Plan</u>			
Retired	5,288	5,281	0.1%	Retired	339	259	30.9%
Disabled	1,310	1,361	-3.7%	Disabled	402	360	11.7%
Beneficiary	<u>2,244</u>	<u>2,240</u>	0.2%	Beneficiary	<u>143</u>	<u>126</u>	13.5%
In Pay Status Total	8,842	8,882	-0.5%	In Pay Status Total	884	745	18.7%
DROP	210	326	-35.6%	DROP	143	153	-6.5%
Deferred Vested	1	1	0.0%	Deferred Vested	107	117	-8.5%
<u>1967 Fire Plan</u>				<u>1987 Fire Plan</u>			
Retired	1,964	1,988	-1.2%	Retired	130	117	11.1%
Disabled	304	317	-4.1%	Disabled	74	68	8.8%
Beneficiary	<u>781</u>	<u>781</u>	0.0%	Beneficiary	<u>54</u>	<u>52</u>	3.8%
In Pay Status Total	3,049	3,086	-1.2%	In Pay Status Total	258	237	8.9%
DROP	64	74	-13.5%	DROP	38	32	18.8%
Deferred Vested	0	0	0.0%	Deferred Vested	16	18	-11.1%

**CITY OF PHILADELPHIA MUNICIPAL RETIREMENT SYSTEM
JULY 1, 2016 ACTUARIAL VALUATION**

APPENDIX A - MEMBERSHIP INFORMATION

**Table A-3
Non-Active Member Data
Total Annual Benefit**

	July 1, 2016	July 1, 2015	% Change		July 1, 2016	July 1, 2015	% Change
<u>Total City</u>				<u>1987 Municipal Plan</u>			
Retired	\$ 578,440,018	\$ 561,136,997	3.1%	Retired	\$ 27,247,983	\$ 23,235,749	17.3%
Disabled	85,036,924	82,396,437	3.2%	Disabled	8,261,001	7,318,622	12.9%
Beneficiary	<u>78,351,397</u>	<u>76,047,517</u>	3.0%	Beneficiary	<u>2,869,500</u>	<u>2,544,624</u>	12.8%
In Pay Status Total	\$ 741,828,339	\$ 719,580,951	3.1%	In Pay Status Total	\$ 38,378,484	\$ 33,098,995	16.0%
DROP (pension)	\$ 57,918,449	\$ 63,920,132	-9.4%	DROP (pension)	\$ 7,431,568	\$ 6,389,322	16.3%
DROP (account balance)	111,988,461	154,170,256	-27.4%	DROP (account balance)	11,960,227	12,128,685	-1.4%
Deferred Vested	\$ 17,941,507	\$ 19,268,000	-6.9%	Deferred Vested	\$ 10,820,310	\$ 11,113,527	-2.6%
<u>1967 Municipal Plan</u>				<u>1987 Elected Plan</u>			
Retired	\$ 317,991,347	\$ 313,327,654	1.5%	Retired	\$ 1,512,097	\$ 1,335,382	13.2%
Disabled	27,466,014	27,828,852	-1.3%	Disabled	0	0	0.0%
Beneficiary	<u>41,991,155</u>	<u>41,458,231</u>	1.3%	Beneficiary	<u>118,681</u>	<u>118,681</u>	0.0%
In Pay Status Total	\$ 387,448,516	\$ 382,614,737	1.3%	In Pay Status Total	\$ 1,630,778	\$ 1,454,063	12.2%
DROP (pension)	\$ 28,856,935	\$ 30,250,664	-4.6%	DROP (pension)	\$ 0	\$ 0	0.0%
DROP (account balance)	52,144,497	65,732,221	-20.7%	DROP (account balance)	0	0	0.0%
Deferred Vested	\$ 5,066,372	\$ 5,898,746	-14.1%	Deferred Vested	\$ 0	\$ 0	0.0%
<u>1967 Police Plan</u>				<u>1987 Police Plan</u>			
Retired	\$ 151,488,911	\$ 146,061,471	3.7%	Retired	\$ 8,187,247	\$ 5,832,952	40.4%
Disabled	24,932,784	24,968,674	-0.1%	Disabled	15,452,251	13,401,072	15.3%
Beneficiary	<u>21,798,921</u>	<u>21,036,614</u>	3.6%	Beneficiary	<u>1,817,171</u>	<u>1,422,636</u>	27.7%
In Pay Status Total	\$ 198,220,616	\$ 192,066,759	3.2%	In Pay Status Total	\$ 25,456,669	\$ 20,656,660	23.2%
DROP (pension)	\$ 11,872,800	\$ 17,518,200	-32.2%	DROP (pension)	\$ 4,760,334	\$ 4,651,398	2.3%
DROP (account balance)	29,618,614	55,498,107	-46.6%	DROP (account balance)	9,236,026	9,740,798	-5.2%
Deferred Vested	\$ 13,436	\$ 13,436	0.0%	Deferred Vested	\$ 1,776,443	\$ 1,918,388	-7.4%
<u>1967 Fire Plan</u>				<u>1987 Fire Plan</u>			
Retired	\$ 69,045,549	\$ 68,774,343	0.4%	Retired	\$ 2,966,884	\$ 2,569,446	15.5%
Disabled	6,169,058	6,337,981	-2.7%	Disabled	2,755,816	2,541,236	8.4%
Beneficiary	<u>9,087,976</u>	<u>8,818,862</u>	3.1%	Beneficiary	<u>667,993</u>	<u>647,869</u>	3.1%
In Pay Status Total	\$ 84,302,583	\$ 83,931,186	0.4%	In Pay Status Total	\$ 6,390,693	\$ 5,758,551	11.0%
DROP (pension)	\$ 3,843,900	\$ 4,168,968	-7.8%	DROP (pension)	\$ 1,152,912	\$ 941,580	22.4%
DROP (account balance)	7,009,290	9,492,798	-26.2%	DROP (account balance)	2,019,807	1,577,648	28.0%
Deferred Vested	\$ 0	\$ 0	0.0%	Deferred Vested	\$ 264,946	\$ 323,903	-18.2%

**CITY OF PHILADELPHIA MUNICIPAL RETIREMENT SYSTEM
JULY 1, 2016 ACTUARIAL VALUATION**

APPENDIX A - MEMBERSHIP INFORMATION

**Table A-4
Non-Active Member Data
Average Annual Benefit**

	July 1, 2016	July 1, 2015	% Change		July 1, 2016	July 1, 2015	% Change
Total City				1987 Municipal Plan			
Retired	\$ 25,809	\$ 25,225	2.3%	Retired	\$ 13,182	\$ 12,930	1.9%
Disabled	21,233	20,517	3.5%	Disabled	18,277	17,982	1.6%
Beneficiary	9,146	8,878	3.0%	Beneficiary	7,473	7,528	-0.7%
In Pay Status Total	\$ 21,205	\$ 20,662	2.6%	In Pay Status Total	\$ 13,220	\$ 13,021	1.5%
DROP (pension)	\$ 35,885	\$ 35,830	0.2%	DROP (pension)	\$ 16,890	\$ 15,546	8.6%
DROP (account balance)	69,386	86,418	-19.7%	DROP (account balance)	27,182	29,510	-7.9%
Deferred Vested	\$ 14,376	\$ 14,444	-0.5%	Deferred Vested	\$ 13,212	\$ 13,137	0.6%
1967 Municipal Plan				1987 Elected Plan			
Retired	\$ 25,229	\$ 24,509	2.9%	Retired	\$ 75,605	\$ 70,283	7.6%
Disabled	18,774	18,516	1.4%	Disabled	0	0	0.0%
Beneficiary	8,471	8,250	2.7%	Beneficiary	29,670	29,670	0.0%
In Pay Status Total	\$ 20,366	\$ 19,812	2.8%	In Pay Status Total	\$ 67,949	\$ 63,220	7.5%
DROP (pension)	\$ 40,135	\$ 38,389	4.5%	DROP (pension)	\$ 0	\$ 0	0.0%
DROP (account balance)	72,524	83,417	-13.1%	DROP (account balance)	0	0	0.0%
Deferred Vested	\$ 16,611	\$ 16,758	-0.9%	Deferred Vested	\$ 0	\$ 0	0.0%
1967 Police Plan				1987 Police Plan			
Retired	\$ 28,648	\$ 27,658	3.6%	Retired	\$ 24,151	\$ 22,521	7.2%
Disabled	19,033	18,346	3.7%	Disabled	38,438	37,225	3.3%
Beneficiary	9,714	9,391	3.4%	Beneficiary	12,707	11,291	12.5%
In Pay Status Total	\$ 22,418	\$ 21,624	3.7%	In Pay Status Total	\$ 28,797	\$ 27,727	3.9%
DROP (pension)	\$ 56,537	\$ 53,737	5.2%	DROP (pension)	\$ 33,289	\$ 30,401	9.5%
DROP (account balance)	141,041	170,240	-17.2%	DROP (account balance)	64,588	63,665	1.4%
Deferred Vested	\$ 13,436	\$ 13,436	0.0%	Deferred Vested	\$ 16,602	\$ 16,396	1.3%
1967 Fire Plan				1987 Fire Plan			
Retired	\$ 35,156	\$ 34,595	1.6%	Retired	\$ 22,822	\$ 21,961	3.9%
Disabled	20,293	19,994	1.5%	Disabled	37,241	37,371	-0.3%
Beneficiary	11,636	11,292	3.1%	Beneficiary	12,370	12,459	-0.7%
In Pay Status Total	\$ 27,649	\$ 27,197	1.7%	In Pay Status Total	\$ 24,770	\$ 24,298	1.9%
DROP (pension)	\$ 60,061	\$ 56,337	6.6%	DROP (pension)	\$ 30,340	\$ 29,424	3.1%
DROP (account balance)	109,520	128,281	-14.6%	DROP (account balance)	53,153	49,302	7.8%
Deferred Vested	\$ 0	\$ 0	0.0%	Deferred Vested	\$ 16,559	\$ 17,995	-8.0%

**CITY OF PHILADELPHIA MUNICIPAL RETIREMENT SYSTEM
JULY 1, 2016 ACTUARIAL VALUATION**

APPENDIX A - MEMBERSHIP INFORMATION

Table A-5

Distribution of Active Participants (Excludes DROP Participants) as of July 1, 2016 -- 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	283	455	32	0	0	0	0	0	0	770
25 to 29	453	1,681	529	67	0	0	0	0	0	2,730
30 to 34	309	1,229	1,338	565	46	0	0	0	0	3,487
35 to 39	173	733	872	1,132	517	35	0	0	0	3,462
40 to 44	129	447	590	858	1,047	430	20	0	0	3,521
45 to 49	129	413	472	668	1,069	1,072	481	7	0	4,311
50 to 54	98	366	399	587	753	866	1,005	241	0	4,315
55 to 59	79	299	334	459	590	548	663	520	0	3,492
60 to 64	32	181	248	296	317	194	165	182	0	1,615
65 & up	19	60	159	132	91	40	28	76	0	605
Total	1,704	5,864	4,973	4,764	4,430	3,185	2,362	1,026	0	28,308

Table A-6

Distribution of Active Participants (Excludes DROP Participants) as of July 1, 2016 -- 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	\$ 32,430	\$ 34,706	\$ 30,938	\$ 0	\$ 0	\$ 0	\$ 0	\$ 0	\$ 0	\$ 33,713
25 to 29	39,655	49,075	54,829	44,427	0	0	0	0	0	48,513
30 to 34	41,059	51,250	62,794	60,891	58,098	0	0	0	0	56,429
35 to 39	39,210	49,939	63,396	65,264	67,417	61,363	0	0	0	60,529
40 to 44	45,216	50,249	62,062	66,051	69,886	71,570	65,314	0	0	64,423
45 to 49	39,519	47,504	55,989	63,697	67,735	74,286	74,786	50,039	0	65,428
50 to 54	37,230	47,542	51,043	56,004	59,925	69,963	72,598	72,782	0	62,689
55 to 59	42,807	42,980	47,761	52,285	55,693	64,441	68,430	76,565	0	60,006
60 to 64	55,336	50,631	50,966	51,725	55,575	60,890	63,413	79,909	0	57,785
65 & up	50,131	52,689	45,467	43,151	45,754	53,275	44,750	65,630	0	48,883
Total	\$ 39,493	\$ 48,181	\$ 58,018	\$ 60,529	\$ 63,853	\$ 69,828	\$ 70,840	\$ 75,279	\$ 0	\$ 59,225

**CITY OF PHILADELPHIA MUNICIPAL RETIREMENT SYSTEM
JULY 1, 2016 ACTUARIAL VALUATION**

APPENDIX A - MEMBERSHIP INFORMATION

Table A-7

Distribution of Active Participants (Excludes DROP Participants) as of July 1, 2016 -- 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
25 to 29	0	0	0	0	0	0	0	0	0
30 to 34	0	0	1	0	0	0	0	0	1
35 to 39	0	0	0	0	0	0	0	0	0
40 to 44	0	0	1	0	0	7	3	0	11
45 to 49	0	0	0	0	0	43	119	1	163
50 to 54	0	2	1	1	2	73	441	173	693
55 to 59	0	0	1	1	2	48	318	332	702
60 to 64	1	0	0	0	2	13	57	77	150
65 & up	0	0	0	0	0	4	19	44	67
Total	1	2	4	2	6	188	957	627	1,787

Table A-8

Distribution of Active Participants (Excludes DROP Participants) as of July 1, 2016 -- 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
25 to 29	0	0	0	0	0	0	0	0	0
30 to 34	0	0	71,807	0	0	0	0	0	71,807
35 to 39	0	0	0	0	0	0	0	0	0
40 to 44	0	0	58,551	0	0	55,064	46,584	0	53,068
45 to 49	0	0	0	0	0	67,131	65,590	59,571	65,960
50 to 54	0	65,496	77,634	33,349	39,648	62,010	64,256	68,115	64,890
55 to 59	0	0	38,598	119,025	41,043	64,936	61,977	73,468	67,602
60 to 64	93,144	0	0	0	39,214	54,352	55,393	75,101	65,456
65 & up	0	0	0	0	0	66,869	43,781	65,190	59,219
Total	\$ 93,144	\$ 65,496	\$ 61,648	\$ 76,187	\$ 39,968	\$ 63,243	\$ 62,675	\$ 71,589	\$ 65,819

**CITY OF PHILADELPHIA MUNICIPAL RETIREMENT SYSTEM
JULY 1, 2016 ACTUARIAL VALUATION**

APPENDIX A - MEMBERSHIP INFORMATION

Table A-9

Distribution of Active Participants (Excludes DROP Participants) as of July 1, 2016 -- 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	7	9	1		17
50 to 54	0	0	0	1	0	0	72	39		112
55 to 59	0	0	0	0	0	0	62	96		158
60 to 64	0	0	0	0	0	0	8	45		53
65 & up	1	0	0	0	0	1	1	7		10
Total	1	0	0	1	0	8	152	188		350

Table A-10

Distribution of Active Participants (Excludes DROP Participants) as of July 1, 2016 -- 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	79,570	79,037	75,035		79,021
50 to 54	0	0	0	73,766	0	0	86,366	94,929		89,235
55 to 59	0	0	0	0	0	0	82,292	89,672		86,776
60 to 64	0	0	0	0	0	0	77,662	92,667		90,402
65 & up	174,900	0	0	0	0	82,073	75,035	79,051		88,536
Total	\$ 174,900	\$ 0	\$ 0	\$ 73,766	\$ 0	\$ 79,883	\$ 83,738	\$ 91,006		\$ 87,786

**CITY OF PHILADELPHIA MUNICIPAL RETIREMENT SYSTEM
JULY 1, 2016 ACTUARIAL VALUATION**

APPENDIX A - MEMBERSHIP INFORMATION

Table A-11

Distribution of Active Participants (Excludes DROP Participants) as of July 1, 2016 -- 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
25 to 29	0	0	0	0	0	0	0	0	0
30 to 34	0	0	0	0	0	0	0	0	0
35 to 39	0	0	0	0	0	0	0	0	0
40 to 44	0	0	0	0	0	0	0	0	0
45 to 49	0	0	0	0	0	0	2	0	2
50 to 54	0	0	0	0	0	0	20	5	25
55 to 59	0	0	0	0	0	0	16	41	57
60 to 64	0	0	0	0	0	0	3	14	17
65 & up	0	0	0	0	0	0	1	4	5
Total	0	0	0	0	0	0	42	64	106

Table A-12

Distribution of Active Participants (Excludes DROP Participants) as of July 1, 2016 -- 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
25 to 29	0	0	0	0	0	0	0	0	0
30 to 34	0	0	0	0	0	0	0	0	0
35 to 39	0	0	0	0	0	0	0	0	0
40 to 44	0	0	0	0	0	0	0	0	0
45 to 49	0	0	0	0	0	0	86,226	0	86,226
50 to 54	0	0	0	0	0	0	85,035	92,798	86,587
55 to 59	0	0	0	0	0	0	80,603	90,258	87,548
60 to 64	0	0	0	0	0	0	78,492	93,426	90,791
65 & up	0	0	0	0	0	0	82,490	112,358	106,384
Total	\$ 0	\$ 0	\$ 0	\$ 0	\$ 0	\$ 0	\$ 82,875	\$ 92,530	\$ 88,705

**CITY OF PHILADELPHIA MUNICIPAL RETIREMENT SYSTEM
JULY 1, 2016 ACTUARIAL VALUATION**

APPENDIX A - MEMBERSHIP INFORMATION

Table A-13

Distribution of Active Participants (Excludes DROP Participants) as of July 1, 2016 -- 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	169	303	27	0	0	0	0	0	499
25 to 29	218	1,036	373	57	0	0	0	0	1,684
30 to 34	162	812	779	362	33	0	0	0	2,148
35 to 39	98	546	568	666	261	30	0	0	2,169
40 to 44	79	373	414	538	489	166	12	0	2,071
45 to 49	89	354	396	467	639	384	89	5	2,423
50 to 54	75	317	391	522	576	390	139	21	2,431
55 to 59	60	264	332	440	520	378	115	44	2,153
60 to 64	24	163	248	289	297	148	61	41	1,271
65 & up	16	56	159	132	88	33	7	18	509
Total	990	4,224	3,687	3,473	2,903	1,529	423	129	17,358

Table A-14

Distribution of Active Participants (Excludes DROP Participants) as of July 1, 2016 -- 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	\$ 24,457	\$ 28,555	\$ 25,956	\$ 0	\$ 0	\$ 0	\$ 0	\$ 0	\$ 27,026
25 to 29	32,438	45,054	47,283	40,950	0	0	0	0	43,776
30 to 34	35,508	48,256	54,660	52,791	52,476	0	0	0	50,446
35 to 39	33,446	47,860	57,585	57,265	56,994	58,828	0	0	53,894
40 to 44	43,721	50,173	56,966	59,974	60,718	60,017	66,271	0	57,203
45 to 49	34,180	46,530	52,657	58,745	60,967	63,972	62,646	43,133	56,589
50 to 54	34,739	47,337	50,523	53,574	54,840	61,680	65,542	63,634	54,060
55 to 59	37,145	43,002	47,542	51,231	53,053	58,417	61,049	57,567	51,616
60 to 64	42,094	50,614	50,966	50,914	54,364	57,716	57,916	64,463	53,091
65 & up	37,197	53,366	45,467	43,151	44,783	48,690	37,662	40,110	45,269
Total	\$ 33,505	\$ 45,792	\$ 52,473	\$ 54,765	\$ 56,672	\$ 60,548	\$ 62,171	\$ 57,751	\$ 51,913

**CITY OF PHILADELPHIA MUNICIPAL RETIREMENT SYSTEM
JULY 1, 2016 ACTUARIAL VALUATION**

APPENDIX A - MEMBERSHIP INFORMATION

Table A-15

Distribution of Active Participants (Excludes DROP Participants) as of July 1, 2016 -- 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
25 to 29	0	0	0	0	0	0	0	0	0
30 to 34	0	0	0	0	0	0	0	0	0
35 to 39	0	0	0	0	0	0	0	0	0
40 to 44	0	1	0	0	0	1	0	0	2
45 to 49	1	3	0	0	1	1	1	0	7
50 to 54	0	2	0	0	1	0	0	0	3
55 to 59	0	0	1	0	0	3	0	1	5
60 to 64	0	0	0	1	0	0	0	4	5
65 & up	0	0	0	0	0	1	0	3	4
Total	1	6	1	1	2	6	1	8	26

Table A-16

Distribution of Active Participants (Excludes DROP Participants) as of July 1, 2016 -- 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
25 to 29	0	0	0	0	0	0	0	0	0
30 to 34	0	0	0	0	0	0	0	0	0
35 to 39	0	0	0	0	0	0	0	0	0
40 to 44	0	129,373	0	0	0	129,373	0	0	129,373
45 to 49	129,373	132,453	0	0	129,373	175,572	129,373	0	137,293
50 to 54	0	129,373	0	0	135,000	0	0	0	131,249
55 to 59	0	0	129,373	0	0	161,935	0	132,011	149,438
60 to 64	0	0	0	133,329	0	0	0	139,932	138,612
65 & up	0	0	0	0	0	100,104	0	131,572	123,705
Total	\$ 129,373	\$ 130,913	\$ 129,373	\$ 133,329	\$ 132,187	\$ 148,476	\$ 129,373	\$ 135,807	\$ 136,485

**CITY OF PHILADELPHIA MUNICIPAL RETIREMENT SYSTEM
JULY 1, 2016 ACTUARIAL VALUATION**

APPENDIX A - MEMBERSHIP INFORMATION

Table A-17

Distribution of Active Participants (Excludes DROP Participants) as of July 1, 2016 -- 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	43	46	3	0	0	0	0	0	92
25 to 29	63	311	137	6	0	0	0	0	517
30 to 34	20	128	446	146	9	0	0	0	749
35 to 39	11	42	229	328	235	3	0	0	848
40 to 44	3	10	141	200	458	226	3	0	1,041
45 to 49	0	9	56	114	312	509	251	0	1,251
50 to 54	0	1	3	36	122	268	301	2	733
55 to 59	0	1	0	11	52	71	114	4	253
60 to 64	0	2	0	4	14	27	30	1	78
65 & up	0	0	0	0	3	0	0	0	3
Total	140	550	1,015	845	1,205	1,104	699	7	5,565

Table A-18

Distribution of Active Participants (Excludes DROP Participants) as of July 1, 2016 -- 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	\$ 51,615	\$ 59,307	\$ 63,813	\$ 0	\$ 0	\$ 0	\$ 0	\$ 0	\$ 55,859
25 to 29	52,127	63,826	73,272	70,392	0	0	0	0	64,980
30 to 34	52,206	65,803	74,166	75,759	71,935	0	0	0	72,434
35 to 39	52,397	66,158	73,970	76,604	77,918	78,465	0	0	75,432
40 to 44	53,145	61,377	73,927	75,292	77,208	79,332	74,612	0	76,628
45 to 49	0	65,331	73,272	74,604	76,338	79,871	82,798	0	78,697
50 to 54	0	70,002	73,139	76,651	76,109	77,619	82,123	78,554	79,144
55 to 59	0	72,918	0	73,766	75,625	78,773	80,010	74,630	78,377
60 to 64	0	64,632	0	73,766	76,487	78,010	78,286	79,983	77,308
65 & up	0	0	0	0	74,259	0	0	0	74,259
Total	\$ 52,024	\$ 64,097	\$ 73,885	\$ 75,785	\$ 76,886	\$ 79,094	\$ 81,824	\$ 76,516	\$ 75,340

**CITY OF PHILADELPHIA MUNICIPAL RETIREMENT SYSTEM
JULY 1, 2016 ACTUARIAL VALUATION**

APPENDIX A - MEMBERSHIP INFORMATION

Table A-19

Distribution of Active Participants (Excludes DROP Participants) as of July 1, 2016 -- 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	28	49	2	0	0	0	0	0	79
25 to 29	55	188	19	4	0	0	0	0	266
30 to 34	51	182	112	57	4	0	0	0	406
35 to 39	11	97	75	138	21	2	0	0	344
40 to 44	6	26	34	120	100	30	2	0	318
45 to 49	4	16	20	87	117	128	10	0	382
50 to 54	2	5	4	27	52	135	32	1	258
55 to 59	0	1	0	7	16	48	38	2	112
60 to 64	0	0	0	2	4	6	6	0	18
65 & up	0	0	0	0	0	1	0	0	1
Total	157	564	266	442	314	350	88	3	2,184

Table A-20

Distribution of Active Participants (Excludes DROP Participants) as of July 1, 2016 -- 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	\$ 50,795	\$ 50,432	\$ 48,892	\$ 0	\$ 0	\$ 0	\$ 0	\$ 0	\$ 50,522
25 to 29	50,859	53,964	69,983	55,021	0	0	0	0	54,482
30 to 34	50,795	59,081	73,998	74,252	73,352	0	0	0	64,426
35 to 39	50,795	58,415	75,117	76,914	79,465	73,722	0	0	70,608
40 to 44	50,795	57,847	75,010	77,893	81,185	78,939	73,722	0	76,542
45 to 49	50,795	53,713	73,587	75,984	81,232	84,346	79,612	0	79,166
50 to 54	50,795	56,194	78,720	75,639	77,622	82,996	89,859	96,909	81,213
55 to 59	0	65,587	0	75,196	78,541	84,089	82,282	74,992	81,800
60 to 64	0	0	0	84,043	80,524	76,309	94,585	0	84,197
65 & up	0	0	0	0	0	74,569	0	0	74,569
Total	\$ 50,817	\$ 56,286	\$ 74,008	\$ 76,382	\$ 80,255	\$ 83,101	\$ 85,378	\$ 82,298	\$ 71,070

**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, 2016 -- 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	43	57	0	0	0	0	0	0	100
25 to 29	117	146	0	0	0	0	0	0	263
30 to 34	76	107	0	0	0	0	0	0	183
35 to 39	53	48	0	0	0	0	0	0	101
40 to 44	41	37	0	0	0	0	0	0	78
45 to 49	35	31	0	0	0	0	0	0	66
50 to 54	21	39	0	0	0	0	0	0	60
55 to 59	19	33	0	0	0	0	0	0	52
60 to 64	7	16	0	0	0	0	0	0	23
65 & up	2	4	0	0	0	0	0	0	6
Total	414	518	0	0	0	0	0	0	932

Table A-22

Distribution of Active Participants (Excludes DROP Participants) as of July 1, 2016 -- 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	\$ 32,620	\$ 34,036	\$ 0	\$ 0	\$ 0	\$ 0	\$ 0	\$ 0	\$ 33,427
25 to 29	41,121	39,887	0	0	0	0	0	0	40,436
30 to 34	43,424	43,237	0	0	0	0	0	0	43,315
35 to 39	44,726	42,274	0	0	0	0	0	0	43,561
40 to 44	46,698	40,528	0	0	0	0	0	0	43,772
45 to 49	49,239	42,021	0	0	0	0	0	0	45,849
50 to 54	44,835	42,403	0	0	0	0	0	0	43,254
55 to 59	60,687	41,213	0	0	0	0	0	0	48,328
60 to 64	95,336	49,049	0	0	0	0	0	0	63,136
65 & up	91,223	43,205	0	0	0	0	0	0	59,211
Total	\$ 44,606	\$ 40,912	\$ 0	\$ 0	\$ 0	\$ 0	\$ 0	\$ 0	\$ 42,553

**CITY OF PHILADELPHIA MUNICIPAL RETIREMENT SYSTEM
JULY 1, 2016 ACTUARIAL VALUATION**

APPENDIX A - MEMBERSHIP INFORMATION

Table A-23 Reconciliation of Plan Membership									
	1967 Plan			Plan 87				Plan '10	Total City
	Municipal	Police	Fire	Municipal	Elected	Police	Fire	Municipal	
Active									
Active July 1, 2015	2,101	402	127	17,399	25	5,569	1,989	339	27,951
New Entrants and Rehires	7	3	2	1,687	6	177	244	636	2,762
Refunded Contributions	-2	0	0	-446	-1	-19	-9	-20	-497
Non-Vested Terminations	-1	0	0	-233	-1	-12	-6	-5	-258
Terminated Vested	-4	0	0	-21	0	-3	-1	0	-29
Became Disabled	-7	0	-1	-29	0	-27	-4	0	-68
Retired	-54	-6	-1	-127	-2	-23	-6	0	-219
Entered DROP	-225	-48	-21	-182	0	-38	-12	0	-526
Net Other Terminations	-28	-1	0	-690	-1	-59	-11	-18	-808
Active July 1, 2016	1,787	350	106	17,358	26	5,565	2,184	932	28,308
Retired									
Retired July 1, 2015	12,784	5,281	1,988	1,797	19	259	117	0	22,245
New Retirees	403	169	32	313	2	87	15	0	1,021
Died with Beneficiary Payable	-124	-62	-23	-10	0	-1	0	0	-220
Died without Beneficiary Payable	-451	-95	-32	-30	0	-1	0	0	-609
Net Other Terminations	-8	-5	-1	-3	-1	-5	-2	0	-25
Retired July 1, 2016	12,604	5,288	1,964	2,067	20	339	130	0	22,412
Beneficiary								0	
Beneficiary July 1, 2015	5,025	2,240	781	338	4	126	52	0	8,566
New Beneficiaries	213	121	39	48	0	18	2	0	441
Deaths	-273	-116	-35	-2	0	-1	0	0	-427
Net Other Terminations	-8	-1	-4	0	0	0	0	0	-13
Beneficiary July 1, 2016	4,957	2,244	781	384	4	143	54	0	8,567

**CITY OF PHILADELPHIA MUNICIPAL RETIREMENT SYSTEM
JULY 1, 2016 ACTUARIAL VALUATION**

APPENDIX A - MEMBERSHIP INFORMATION

Table A-23 Reconciliation of Plan Membership (continued)									
	1967 Plan			Plan 87				Plan '10	Total City
	Municipal	Police	Fire	Municipal	Elected	Police	Fire	Municipal	
Disabled									
Disabled July 1, 2015	1,503	1,361	317	407	0	360	68	0	4,016
New Disabilities	18	4	1	51	0	42	7	0	123
Died with Beneficiary Payable	-9	-11	-4	0	0	0	0	0	-24
Died without Beneficiary Payable	-49	-44	-10	-5	0	0	0	0	-108
Net Other Terminations	0	0	0	-1	0	0	-1	0	-2
Disabled July 1, 2016	1,463	1,310	304	452	0	402	74	0	4,005
Terminated Vested									
Terminated Vested July 1, 2015	352	1	0	846	0	117	18	0	1,334
New Vested Terminations	4	0	0	22	0	4	1	0	31
Retired	-42	0	0	-23	0	-9	-3	0	-77
Net Other Terminations	-9	0	0	-26	0	-5	0	0	-40
Terminated Vested July 1, 2016	305	1	0	819	0	107	16	0	1,248
DROP									
DROP July 1, 2015	788	326	74	411	0	153	32	0	1,784
New DROP Participants	227	48	21	182	0	38	12	0	528
Retired	-293	-162	-31	-149	0	-46	-6	0	-687
Net Other Terminations	-3	-2	0	-4	0	-2	0	0	-11
DROP July 1, 2016	719	210	64	440	0	143	38	0	1,614

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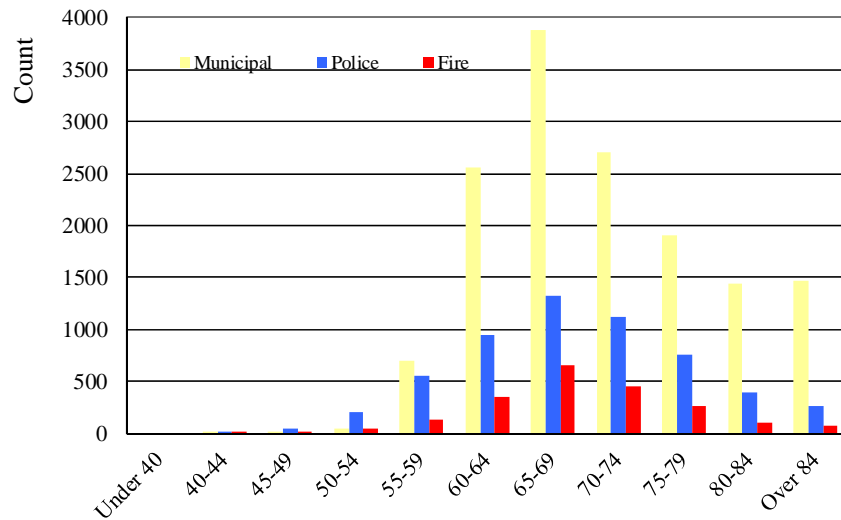
APPENDIX A - MEMBERSHIP INFORMATION

Table A-24

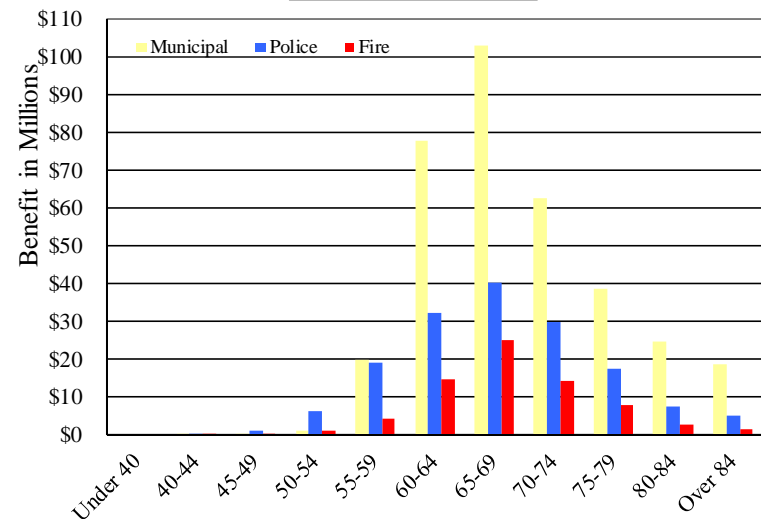
Age Distribution of Retired Members as of July 1, 2016

Age	Municipal		Police		Fire	
	Count	Annual Pensions	Count	Annual Pensions	Count	Annual Pensions
Under 40	0	\$ 0	0	\$ 0	0	\$ 0
40-44	1	9,206	2	25,469	1	10,728
45-49	1	1,836	42	1,166,677	3	116,488
50-54	53	1,098,226	202	6,220,711	45	1,075,206
55-59	699	19,781,206	554	19,165,701	129	4,387,181
60-64	2,554	77,832,216	943	32,445,270	355	14,841,787
65-69	3,872	103,165,960	1,331	40,369,058	652	25,148,560
70-74	2,704	62,533,091	1,128	29,862,594	452	14,383,683
75-79	1,907	38,647,368	762	17,494,066	272	8,010,443
80-84	1,436	24,789,239	394	7,746,502	111	2,634,945
Over 84	1,464	18,893,079	269	5,180,110	74	1,403,412
Total	14,691	346,751,427	5,627	159,676,158	2,094	72,012,433

Count Distribution



Benefit Distribution



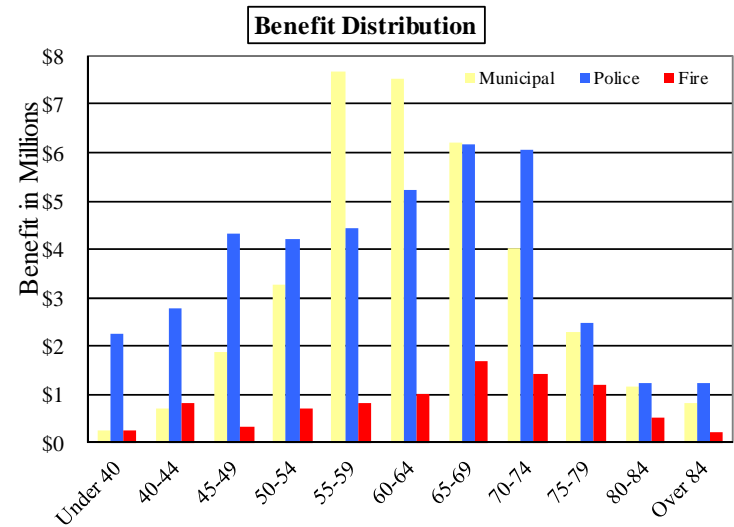
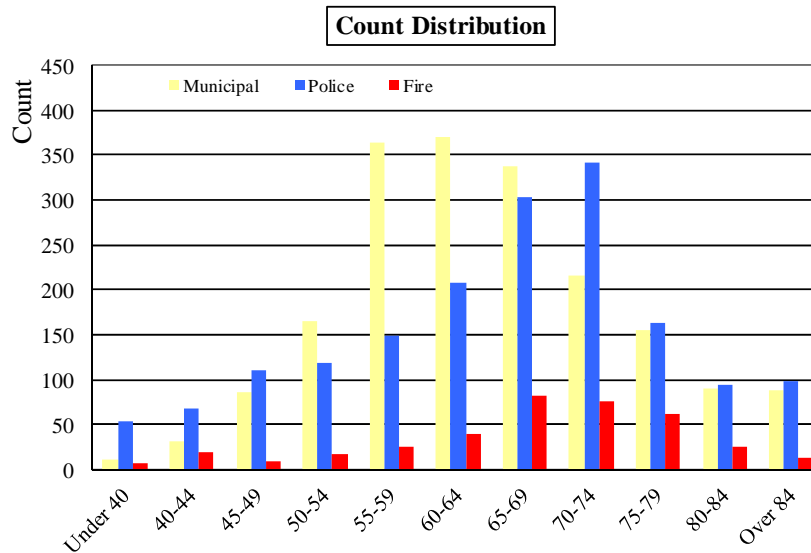
**CITY OF PHILADELPHIA MUNICIPAL RETIREMENT SYSTEM
JULY 1, 2016 ACTUARIAL VALUATION**

APPENDIX A - MEMBERSHIP INFORMATION

Table A-25

Age Distribution of Disabled Members as of July 1, 2016

Age	Municipal		Police		Fire	
	Count	Annual Pensions	Count	Annual Pensions	Count	Annual Pensions
Under 40	11	\$ 243,696	53	\$ 2,246,427	7	\$ 244,342
40-44	32	717,216	69	2,764,759	20	818,920
45-49	87	1,871,667	111	4,328,878	10	307,961
50-54	165	3,268,238	119	4,200,567	17	686,545
55-59	364	7,659,177	149	4,446,563	25	829,109
60-64	370	7,509,515	209	5,210,412	39	1,020,404
65-69	337	6,224,649	303	6,155,655	83	1,686,670
70-74	216	4,016,028	342	6,068,819	76	1,408,353
75-79	155	2,271,653	164	2,475,495	63	1,199,432
80-84	90	1,142,098	94	1,247,524	25	505,433
Over 84	88	803,078	99	1,239,936	13	217,705
Total	1,915	35,727,015	1,712	40,385,035	378	8,924,874



**CITY OF PHILADELPHIA MUNICIPAL RETIREMENT SYSTEM
JULY 1, 2016 ACTUARIAL VALUATION**

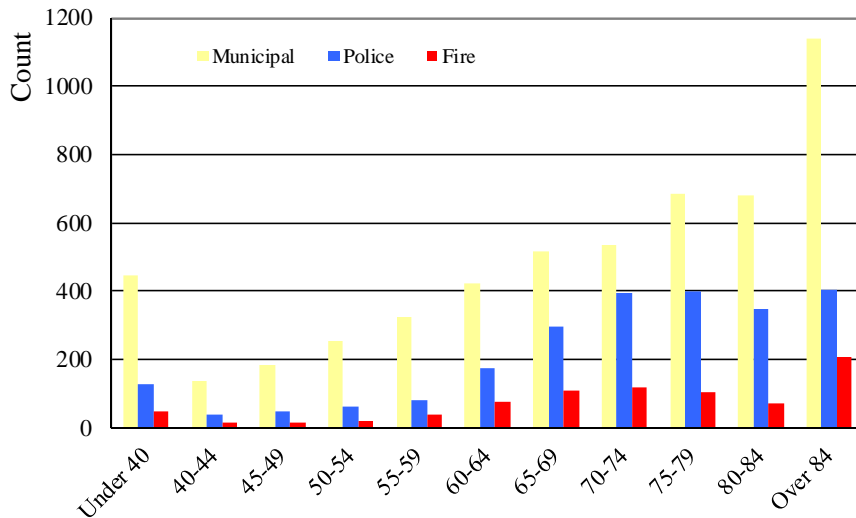
APPENDIX A - MEMBERSHIP INFORMATION

Table A-26

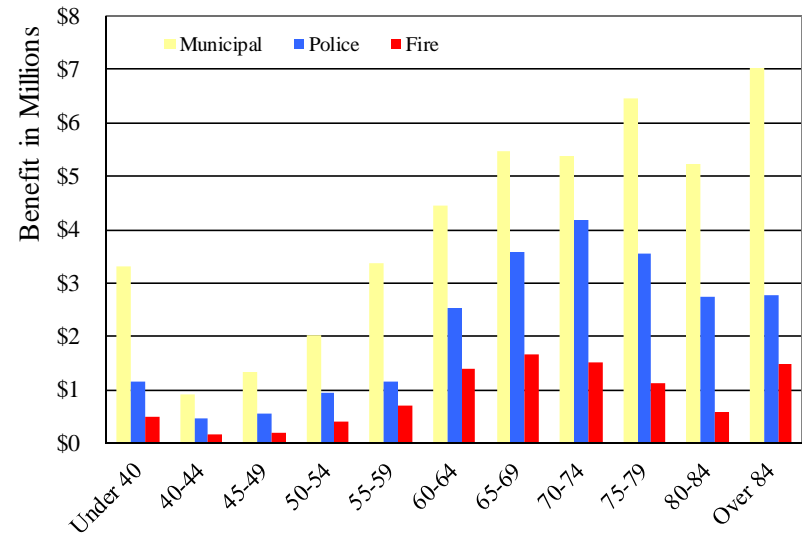
Age Distribution of Beneficiaries as of July 1, 2016

Age	Municipal		Police		Fire	
	Count	Annual Pensions	Count	Annual Pensions	Count	Annual Pensions
Under 40	448	\$ 3,305,605	130	\$ 1,153,873	50	\$ 498,298
40-44	138	918,155	39	471,384	17	175,803
45-49	187	1,341,578	48	543,832	17	189,600
50-54	256	2,013,530	65	942,789	19	397,490
55-59	327	3,371,949	82	1,144,482	39	704,876
60-64	425	4,437,704	176	2,523,151	77	1,394,350
65-69	518	5,473,149	298	3,591,745	108	1,674,920
70-74	538	5,384,551	396	4,192,673	121	1,522,417
75-79	685	6,467,910	401	3,541,617	107	1,129,731
80-84	682	5,240,204	349	2,728,278	70	592,646
Over 84	1,141	7,025,001	403	2,782,268	210	1,475,838
Total	5,345	44,979,336	2,387	23,616,092	835	9,755,969

Count Distribution



Benefit Distribution



**CITY OF PHILADELPHIA MUNICIPAL RETIREMENT SYSTEM
JULY 1, 2016 ACTUARIAL VALUATION**

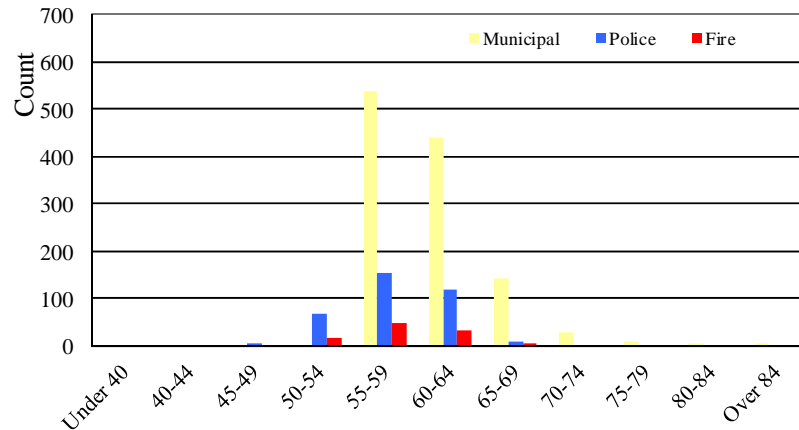
APPENDIX A - MEMBERSHIP INFORMATION

Table A-27

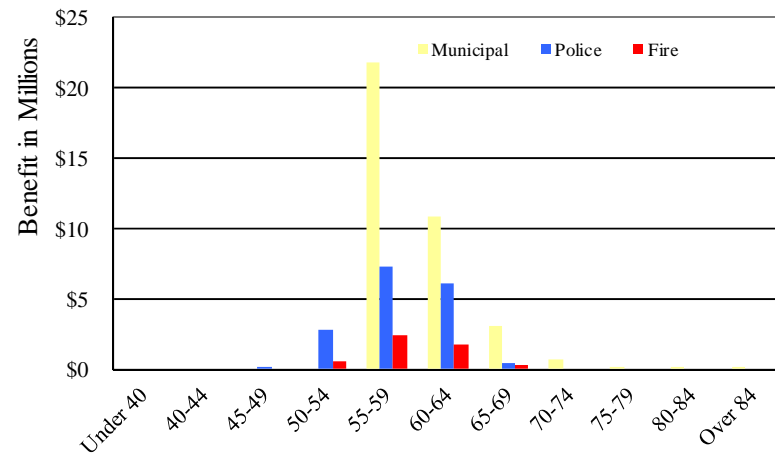
Age Distribution of DROP Participants as of July 1, 2016

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	4	165,984	0	0
50-54	0	0	67	2,754,552	15	584,292
55-59	538	21,806,563	154	7,266,796	50	2,360,004
60-64	441	10,783,098	118	6,057,365	33	1,727,688
65-69	143	2,975,038	10	388,437	4	324,828
70-74	27	600,816	0	0	0	0
75-79	7	88,764	0	0	0	0
80-84	2	17,160	0	0	0	0
Over 84	1	17,064	0	0	0	0
Total	1,159	36,288,503	353	16,633,134	102	4,996,812

Count Distribution



Benefit Distribution



**CITY OF PHILADELPHIA MUNICIPAL RETIREMENT SYSTEM
JULY 1, 2016 ACTUARIAL VALUATION**

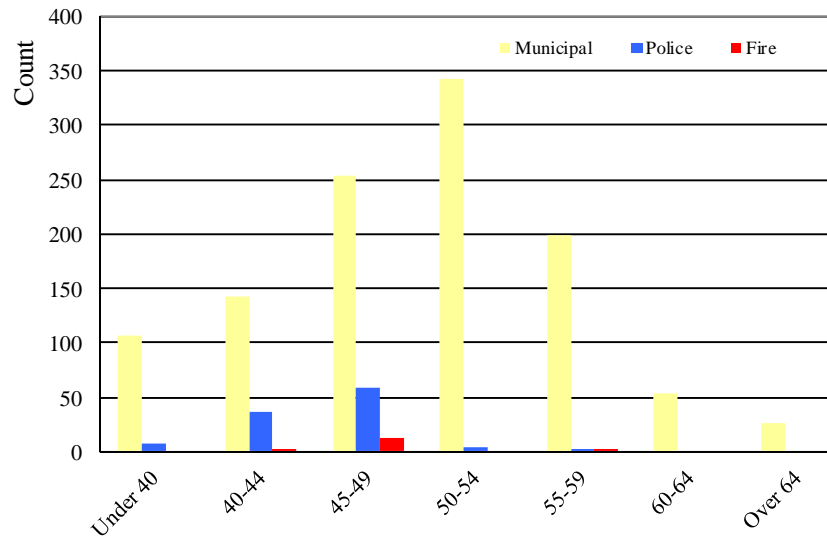
APPENDIX A - MEMBERSHIP INFORMATION

Table A-28

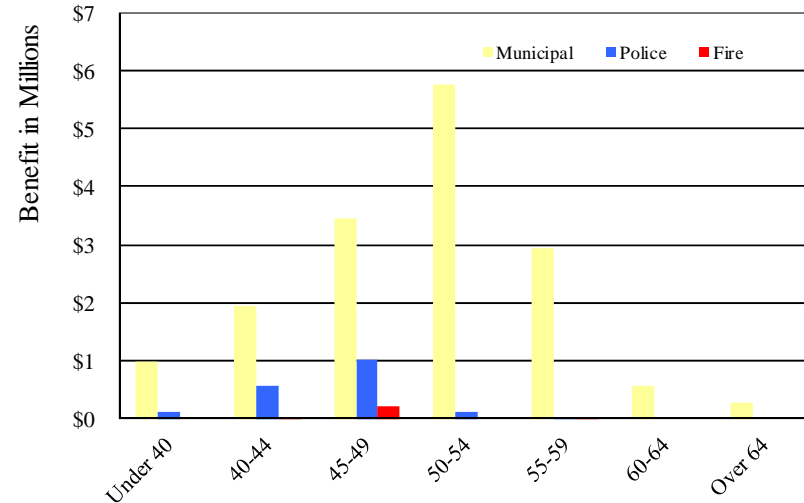
Age Distribution of Terminated Vested Members as of July 1, 2016

Age	Municipal		Police		Fire	
	Count	Annual Pensions	Count	Annual Pensions	Count	Annual Pensions
Under 40	107	\$ 980,796	7	\$ 112,731	0	\$ 0
40-44	143	1,949,826	36	554,838	2	26,153
45-49	253	3,457,692	59	1,006,680	13	228,106
50-54	343	5,750,933	5	102,194	0	0
55-59	198	2,923,507	1	13,436	1	10,687
60-64	53	559,704	0	0	0	0
Over 64	27	264,224	0	0	0	0
Total	1,124	15,886,682	108	1,789,879	16	264,946

Count Distribution



Benefit Distribution



**CITY OF PHILADELPHIA MUNICIPAL RETIREMENT SYSTEM
JULY 1, 2016 ACTUARIAL VALUATION**

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.

Table B-1a Development of the Fiscal Year 2018 Amortization Payment under the City's Funding Policy 1967 Plan - Municipal (\$ thousands)					
	7/1/2016 Outstanding Balance	7/1/2017 Expected Balance	Remaining Years	FY 2018 Payment Beginning-of-Year	FY 2018 Payment End-of-Year
1. Expected Unfunded Actuarial Liability (UAL) as of July 1, 2016 Based on July 1, 2015 Valuation					
a. Remaining	\$ 2,733,183	\$ 2,453,656		\$ 457,627	\$ 492,864
2. Changes in UAL due to					
a. Actuarial Experience	\$ 209,155	\$ 225,260	20	\$ 20,830	\$ 22,433
b. Assumption Changes	16,357	17,616	15	1,876	2,021
c. Active Plan Changes	0	0	10	0	0
d. Inactive Plan Changes	<u>0</u>	<u>0</u>	1	<u>0</u>	<u>0</u>
e. Subtotal	\$ 225,512	\$ 242,876		\$ 22,706	\$ 24,454
3. Total [1c. + 2e.]	\$ 2,958,695	\$ 2,696,533		\$ 480,332	\$ 517,318

**CITY OF PHILADELPHIA MUNICIPAL RETIREMENT SYSTEM
JULY 1, 2016 ACTUARIAL VALUATION**

APPENDIX B - SUPPORTING TABLES FOR CITY'S FUNDING POLICY

Table B-1b					
Development of the Fiscal Year 2018 Amortization Payment under the City's Funding Policy					
1967 Plan - Police					
(\$ thousands)					
	7/1/2016	7/1/2017	Remaining	FY 2018 Payment	FY 2018 Payment
	Outstanding Balance	Expected Balance	Years	Beginning-of-Year	End-of-Year
1. Expected Unfunded Actuarial Liability (UAL) as of July 1, 2016 Based on July 1, 2015 Valuation					
a. Remaining	\$ 1,382,529	\$ 1,239,728		\$ 235,924	\$ 254,090
2. Changes in UAL due to					
a. Actuarial Experience	\$ 127,697	\$ 137,530	20	\$ 12,717	\$ 13,696
b. Assumption Changes	7,433	8,005	15	853	918
c. Active Plan Changes	0	0	10	0	0
d. Inactive Plan Changes	0	0	1	0	0
e. Subtotal	\$ 135,130	\$ 145,535		\$ 13,570	\$ 14,615
3. Total [1c. + 2e.]	\$ 1,517,659	\$ 1,385,263		\$ 249,494	\$ 268,705

**CITY OF PHILADELPHIA MUNICIPAL RETIREMENT SYSTEM
JULY 1, 2016 ACTUARIAL VALUATION**

APPENDIX B - SUPPORTING TABLES FOR CITY'S FUNDING POLICY

Table B-1c					
Development of the Fiscal Year 2018 Amortization Payment under the City's Funding Policy					
1967 Plan - Fire					
(\$ thousands)					
	7/1/2016	7/1/2017	Remaining	FY 2018 Payment	FY 2018 Payment
	Outstanding Balance	Expected Balance	Years	Beginning-of-Year	End-of-Year
1. Expected Unfunded Actuarial Liability (UAL) as of July 1, 2016 Based on July 1, 2015 Valuation					
a. Remaining	\$ 595,689	\$ 532,816		\$ 100,011	\$ 107,712
2. Changes in UAL due to					
a. Actuarial Experience	\$ 51,399	\$ 55,357	20	\$ 5,119	\$ 5,513
b. Assumption Changes	2,932	3,157	15	336	362
c. Active Plan Changes	0	0	10	0	0
d. Inactive Plan Changes	0	0	1	0	0
e. Subtotal	<u>\$ 54,331</u>	<u>\$ 58,514</u>		<u>\$ 5,455</u>	<u>\$ 5,875</u>
3. Total [1c. + 2e.]	\$ 650,020	\$ 591,331		\$ 105,466	\$ 113,587

**CITY OF PHILADELPHIA MUNICIPAL RETIREMENT SYSTEM
JULY 1, 2016 ACTUARIAL VALUATION**

APPENDIX B - SUPPORTING TABLES FOR CITY'S FUNDING POLICY

**Table B-1d
Development of the Fiscal Year 2018 Amortization Payment under the City's Funding Policy
Plan 87 - Municipal
(\$ thousands)**

	7/1/2016 Outstanding Balance	7/1/2017 Expected Balance	Remaining Years	FY 2018 Payment Beginning-of-Year	FY 2018 Payment End-of-Year
1. Expected Unfunded Actuarial Liability (UAL) as of July 1, 2016 Based on July 1, 2015 Valuation					
a. Remaining	\$ 482,774	\$ 456,351		\$ 59,500	\$ 64,081
2. Changes in UAL due to					
a. Actuarial Experience	\$ 81,106	\$ 87,351	20	\$ 8,077	\$ 8,699
b. Assumption Changes	12,038	12,965	15	1,381	1,487
c. Active Plan Changes	0	0	10	0	0
d. Inactive Plan Changes	0	0	1	0	0
e. Subtotal	<u>\$ 93,144</u>	<u>\$ 100,316</u>		<u>\$ 9,458</u>	<u>\$ 10,186</u>
3. Total [1c. + 2e.]	\$ 575,918	\$ 556,667		\$ 68,958	\$ 74,267

**CITY OF PHILADELPHIA MUNICIPAL RETIREMENT SYSTEM
JULY 1, 2016 ACTUARIAL VALUATION**

APPENDIX B - SUPPORTING TABLES FOR CITY'S FUNDING POLICY

**Table B-1e
Development of the Fiscal Year 2018 Amortization Payment under the City's Funding Policy
Plan 87 - Elected
(\$ thousands)**

	7/1/2016 Outstanding Balance	7/1/2017 Expected Balance	Remaining Years	FY 2018 Payment Beginning-of-Year	FY 2018 Payment End-of-Year
1. Expected Unfunded Actuarial Liability (UAL) as of July 1, 2016 Based on July 1, 2015 Valuation					
a. Remaining	\$ 12,461	\$ 11,569		\$ 1,725	\$ 1,858
2. Changes in UAL due to					
a. Actuarial Experience	\$ 2,928	\$ 3,153	20	\$ 292	\$ 314
b. Assumption Changes	119	128	15	14	15
c. Active Plan Changes	0	0	10	0	0
d. Inactive Plan Changes	0	0	1	0	0
e. Subtotal	\$ 3,047	\$ 3,281		\$ 305	\$ 329
3. Total [1c. + 2e.]	\$ 15,508	\$ 14,851		\$ 2,030	\$ 2,187

**CITY OF PHILADELPHIA MUNICIPAL RETIREMENT SYSTEM
JULY 1, 2016 ACTUARIAL VALUATION**

APPENDIX B - SUPPORTING TABLES FOR CITY'S FUNDING POLICY

**Table B-1f
Development of the Fiscal Year 2018 Amortization Payment under the City's Funding Policy
Plan 87 - Police
(\$ thousands)**

	7/1/2016 Outstanding Balance	7/1/2017 Expected Balance	Remaining Years	FY 2018 Payment Beginning-of-Year	FY 2018 Payment End-of-Year
1. Expected Unfunded Actuarial Liability (UAL) as of July 1, 2016 Based on July 1, 2015 Valuation					
a. Remaining	\$ 225,897	\$ 211,079		\$ 29,758	\$ 32,049
2. Changes in UAL due to					
a. Actuarial Experience	\$ 51,965	\$ 55,967	20	\$ 5,175	\$ 5,574
b. Assumption Changes	9,582	10,319	15	1,099	1,184
c. Active Plan Changes	0	0	10	0	0
d. Inactive Plan Changes	0	0	1	0	0
e. Subtotal	\$ 61,547	\$ 66,286		\$ 6,274	\$ 6,757
3. Total [1c. + 2e.]	\$ 287,444	\$ 277,365		\$ 36,032	\$ 38,807

**CITY OF PHILADELPHIA MUNICIPAL RETIREMENT SYSTEM
JULY 1, 2016 ACTUARIAL VALUATION**

APPENDIX B - SUPPORTING TABLES FOR CITY'S FUNDING POLICY

**Table B-1g
Development of the Fiscal Year 2018 Amortization Payment under the City's Funding Policy
Plan 87 - Fire
(\$ thousands)**

	7/1/2016 Outstanding Balance	7/1/2017 Expected Balance	Remaining Years	FY 2018 Payment Beginning-of-Year	FY 2018 Payment End-of-Year
1. Expected Unfunded Actuarial Liability (UAL) as of July 1, 2016 Based on July 1, 2015 Valuation					
a. Remaining	\$ 70,171	\$ 65,877		\$ 8,939	\$ 9,627
2. Changes in UAL due to					
a. Actuarial Experience	\$ 10,470	\$ 11,276	20	\$ 1,043	\$ 1,123
b. Assumption Changes	2,709	2,917	15	311	335
c. Active Plan Changes	0	0	10	0	0
d. Inactive Plan Changes	0	0	1	0	0
e. Subtotal	<u>\$ 13,178</u>	<u>\$ 14,193</u>		<u>\$ 1,353</u>	<u>\$ 1,458</u>
3. Total [1c. + 2e.]	\$ 83,349	\$ 80,070		\$ 10,292	\$ 11,085

**CITY OF PHILADELPHIA MUNICIPAL RETIREMENT SYSTEM
JULY 1, 2016 ACTUARIAL VALUATION**

APPENDIX B - SUPPORTING TABLES FOR CITY'S FUNDING POLICY

Table B-1h						
Development of the Fiscal Year 2018 Amortization Payment under the City's Funding Policy						
Plan 10 - Municipal						
(\$ thousands)						
	7/1/2016		7/1/2017	Remaining	FY 2018 Payment	FY 2018 Payment
	Outstanding Balance		Expected Balance	Years	Beginning-of-Year	End-of-Year
1. Expected Unfunded Actuarial Liability (UAL) as of July 1, 2016 Based on July 1, 2015 Valuation						
a. Remaining	\$ 40	\$	39		\$ 4	\$ 4
2. Changes in UAL due to						
a. Actuarial Experience	\$ 133	\$	143	20	\$ 13	\$ 14
b. Assumption Changes	13		14	15	1	2
c. Active Plan Changes	0		0	10	0	0
d. Inactive Plan Changes	0		0	1	0	0
e. Subtotal	\$ 145	\$	156		\$ 15	\$ 16
3. Total [1c. + 2e.]	\$ 185	\$	195		\$ 18	\$ 20

**CITY OF PHILADELPHIA MUNICIPAL RETIREMENT SYSTEM
JULY 1, 2016 ACTUARIAL VALUATION**

APPENDIX B - SUPPORTING TABLES FOR CITY'S FUNDING POLICY

Table B-1i					
Development of the Fiscal Year 2018 Amortization Payment under the City's Funding Policy					
Total - All Divisions					
(\$ thousands)					
	7/1/2016	7/1/2017	Remaining	FY 2018 Payment	FY 2018 Payment
	Outstanding Balance	Expected Balance	Years	Beginning-of-Year	End-of-Year
1. Expected Unfunded Actuarial Liability (UAL) as of July 1, 2016 Based on July 1, 2015 Valuation					
a. Remaining	\$ 5,502,744	\$ 4,971,116		\$ 893,487	\$ 962,286
2. Changes in UAL due to					
a. Actuarial Experience	\$ 534,853	\$ 576,037	20	\$ 53,266	\$ 57,367
b. Assumption Changes	51,181	55,122	15	5,870	6,322
c. Active Plan Changes	0	0	10	0	0
d. Inactive Plan Changes	0	0	1	0	0
e. Subtotal	<u>\$ 586,034</u>	<u>\$ 631,159</u>		<u>\$ 59,136</u>	<u>\$ 63,689</u>
3. Total [1c. + 2e.]	\$ 6,088,778	\$ 5,602,275		\$ 952,623	\$ 1,025,975

**CITY OF PHILADELPHIA MUNICIPAL RETIREMENT SYSTEM
JULY 1, 2016 ACTUARIAL VALUATION**

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, 60% 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.

**CITY OF PHILADELPHIA MUNICIPAL RETIREMENT SYSTEM
JULY 1, 2016 ACTUARIAL VALUATION**

APPENDIX C - SUMMARY OF ACTUARIAL ASSUMPTIONS AND METHODS

- 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.
- 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, and fully vested became a terminated vested with total credited service equal to credited service from last year plus one and final pay equal to pay from last year increased by the salary scale assumption.
- We assumed that any participant who was active last year, missing this year, and not fully vested became 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, 2016 ACTUARIAL VALUATION**

APPENDIX C - SUMMARY OF ACTUARIAL ASSUMPTIONS AND METHODS

A. Actuarial Assumptions

1. Investment Return Assumption

7.70% compounded annually, net of expenses.

2. Salary Increase Rate

Age	All Divisions
<20	20.00%
20-24	11.00%
25-29	7.00%
30-34	5.00%
35-39	4.25%
40-44	4.00%
45-49	3.50%
50-54	3.30%
55-60	3.00%
61+	2.75%

3. Total Annual Payroll Growth

3.30% per year.

4. Administrative Expenses

Annual expected expenses included in this report are \$8,836,114, and assumed to increase by 3.30% per year.

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
JULY 1, 2016 ACTUARIAL VALUATION**

APPENDIX C - SUMMARY OF ACTUARIAL ASSUMPTIONS AND METHODS

6. Rates of Termination

Age	1967 Plan			1987 Plan	
	Municipal		Uniformed	Municipal and Elected Officials	Uniformed
	Male	Female	Unisex	Unisex	Unisex
20	0.100000	0.105319	0.022050	0.260000	0.030000
25	0.086000	0.096000	0.021148	0.150000	0.037800
30	0.072000	0.071562	0.019148	0.105000	0.029900
35	0.045000	0.056170	0.016148	0.090000	0.025200
40	0.035000	0.039379	0.012148	0.090000	0.015400
45	0.030000	0.035597	0.000000	0.075000	0.010000
50	0.020000	0.022400	0.000000	0.065000	0.001600
55	0.000000	0.000000	0.000000	0.050000	0.001600

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

Age	Municipal and Elected Officials		Uniformed
	Male	Female	Unisex
20	0.000025	0.000043	0.000795
25	0.000070	0.000061	0.000870
30	0.000557	0.000263	0.002668
35	0.001014	0.000870	0.005418
40	0.001800	0.001564	0.004684
45	0.002340	0.003109	0.003834
50	0.006600	0.004535	0.003154
55	0.007680	0.007338	0.000000
60	0.000000	0.000000	0.000000

For municipal and elected members, we assume that 70% of all disabilities are ordinary and 30% are service-connected. For police and fire members, we assume that 50% are ordinary and 50% are service-connected.

**CITY OF PHILADELPHIA MUNICIPAL RETIREMENT SYSTEM
JULY 1, 2016 ACTUARIAL VALUATION**

APPENDIX C - SUMMARY OF ACTUARIAL ASSUMPTIONS AND METHODS

8. Rates of Pre-Retirement Mortality (RP 2000 with Blue Collar adjustment, projected 17 years using Scale AA with a five year set back for Municipal males and females and a 2 year set back for Police and Fire males and females)

Experience studies are performed every four years as required by State law which require 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, 2008 and June 30, 2013.

Age	Municipal and Elected Officials		Uniformed	
	Male	Female	Male	Female
20	0.000194	0.000129	0.000228	0.000143
25	0.000291	0.00015	0.000314	0.000155
30	0.000345	0.000174	0.000361	0.000198
35	0.000667	0.000243	0.000871	0.000342
40	0.000948	0.000401	0.001101	0.000553
45	0.001098	0.000667	0.001274	0.000894
50	0.001317	0.001036	0.001563	0.001279
55	0.001741	0.001712	0.002379	0.002101
60	0.003190	0.002567	0.004864	0.003488
65	0.006507	0.004545	0.009686	0.007327

* 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.

9. Rates of Post-Retirement Mortality

For all groups we assume that mortality for healthy inactive lives will follow RP 2000 with Blue Collar adjustment, projected 17 years using Scale AA with a one year set forward for males and females.

Age	Male	Female
50	0.002015	0.001568
55	0.003585	0.002669
60	0.007167	0.005321
65	0.013813	0.010871
70	0.022690	0.019040
75	0.037529	0.029472
80	0.065888	0.048128
85	0.112135	0.083357
90	0.183439	0.141251
95	0.274405	0.198507

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APPENDIX C - SUMMARY OF ACTUARIAL ASSUMPTIONS AND METHODS

10. Rates of Post-Disability Mortality

For Police and Fire, we assume that mortality for disabled retirees follows RP 2000 Healthy mortality with Blue Collar adjustment, projected 17 years using Scale AA, with a 5 year set back for males and females and a 1% upward adjustment. For Municipal and Elected officials, we assume the same mortality table with projections as Police and Fire, but with a 1 year set back for males and females and a 1% upward adjustment.

Age	Municipal and Elected Officials		Uniformed	
	Male	Female	Male	Female
35	0.02073	0.00617	0.02073	0.00617
40	0.01969	0.00576	0.01969	0.00576
45	0.01807	0.00566	0.01807	0.00566
50	0.02033	0.00795	0.01657	0.00557
55	0.02465	0.01352	0.02091	0.01006
60	0.03092	0.01907	0.02694	0.01519
65	0.03801	0.02443	0.03308	0.02006
70	0.04611	0.03245	0.03881	0.02574
75	0.06099	0.04265	0.04925	0.03283
80	0.08715	0.06016	0.06918	0.04635

11. Rates of Retirement

Age	Rates of Service Retirement - 1967 Plan	
	Municipal	Uniformed
45-51	0.00	0.09
52	0.05	0.09
53	0.05	0.15
54	0.05	0.15
55	0.45	0.20
56	0.32	0.25
57	0.30	0.25
58	0.32	0.30
59	0.32	0.35
60	0.32	0.40
61	0.35	0.40
62	0.40	0.42
63	0.25	0.42
64	0.25	0.42
65	0.30	0.42
66	0.25	0.42
67	0.30	0.42
68	0.25	0.42
69	0.15	0.42
70 and up	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
40-49	0.000	0.000	0.030	0.015
50	0.000	0.000	0.100	0.080
51	0.000	0.000	0.100	0.055
52	0.050	0.020	0.100	0.070
53	0.100	0.020	0.100	0.080
54	0.100	0.020	0.100	0.100
55	0.250	0.020	0.100	0.120
56	0.250	0.020	0.100	0.140
57	0.250	0.020	0.100	0.120
58	0.250	0.020	0.100	0.165
59	0.300	0.080	0.100	0.140
60	0.500	0.300	0.100	0.170
61	0.400	0.200	0.100	0.170
62	0.400	0.250	0.100	0.215
63	0.500	0.200	0.100	0.205
64	0.300	0.200	0.100	0.200
65	0.600	0.200	0.100	1.000
66	0.600	0.200	0.100	1.000
67	0.600	0.200	0.100	1.000
68	0.600	0.200	0.100	1.000
69	0.600	0.200	0.100	1.000
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 60% 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.

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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, 2008 through June 30, 2013 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 14, 2014.

15. Changes Since Last Valuation

The interest rate assumption was decreased from 7.75% to 7.70%.

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

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.

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 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 new funding methodology objective.

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APPENDIX C - SUMMARY OF ACTUARIAL ASSUMPTIONS AND METHODS

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

The City initiated a new Funding Method, the Revenue Recognition Policy which calculates contributions without the recognition of accumulated value of sales tax revenue and tier member contributions received by the System.

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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 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.

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

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 participates in the Social Security System contributes 3¾% of total compensation up to the taxable wage base (\$113,700 in 2013, \$117,000 in 2014, \$118,500 in 2015, and \$118,500 in 2016) 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.

Effective 11/14/2014 guards represented by DC 33 contribute the higher of 3¾% of pay (or 6% of pay if they do not participate in Social Security System) and 50% of aggregate normal cost of all members in Plan J.

All other 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.

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.

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APPENDIX D - SUMMARY OF PLAN PROVISIONS – 1967 PLAN

Uniformed (Plans D and X):

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

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.

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.

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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.

If there are no spouse or dependent children, each dependent parent is entitled to receive a

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APPENDIX D - SUMMARY OF PLAN PROVISIONS – 1967 PLAN

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.

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.

APPENDIX D - SUMMARY OF PLAN PROVISIONS – 1967 PLAN

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

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 four optional forms. Options 1, 2, and 3 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.

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

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.

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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 dependent children at age 18 (age 22 if 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.

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' 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.

Uniformed (Plans A and B):

Same as municipal except for 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.

Elected (Plan L):

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

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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 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 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.

Effective 11/14/2014 all guards represented by DC 33 contribute at 50% of aggregate normal cost. Other 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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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. Exempt and non-represented 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 five years.

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.

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.

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 or 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

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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.

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.

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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.

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).

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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 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.

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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.

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).

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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 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.

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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.

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.

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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.

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.

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16. Survivor Benefits

Eligibility

Municipal (Plan Y):

Service pensions, deferred vested benefits, service-connected disability benefits, and ordinary disability benefits are payable under four 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.

17. Service-Connected Health Care Benefit

Eligibility

Municipal (Plan Y):

Not applicable.

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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 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 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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APPENDIX D - SUMMARY OF PLAN PROVISIONS – PLAN ‘10

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.

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 with 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.

Uniformed:

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

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.

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Benefit Amount

Municipal:

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

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.

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Benefit

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.

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.

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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.

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).

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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.

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.

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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 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.

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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.

16. Survivor Benefits

Eligibility

Municipal:

Service pensions, deferred vested benefits, service-connected disability benefits, and ordinary disability benefits are payable under four 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:

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.

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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 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 service and have reached minimum retirement age.

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APPENDIX D - SUMMARY OF PLAN PROVISIONS – PLAN ‘16

All employees represented by AFSCME District Council 33 hired or rehired on or after August 20, 2016 will be required to participate in the new Stacked Hybrid Plan – Plan 16. Plan 16 benefits are similar to Plan 87 except that compensation used in calculating benefits is capped at \$50,000, annually on a calendar year basis. Member contributions for new hires will also be based on the capped pay.

Member contributions for current and future DC #33 members will increase based on the level of pay (limited to the capped pay for new entrants) and will be paid in addition to base member contributions rates as shown on the next page. The table below shows the tiers used in determining the additional member tier contributions.

Annual Salary	Base member rates plus
\$45,000 or less	0.00%
\$45,000 - \$55,000	0.50%
\$55,000 - \$75,000	1.50%
\$75,000 - \$100,000	2.75%
More than \$100,000	3.00%

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 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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APPENDIX D - SUMMARY OF PLAN PROVISIONS – LEGISLATIVE CHANGES

Member Contribution Rates by Membership Class			Effective Date	
Plan 67	No SSA Coverage	Plan D (Police)	7/1/2017	
		Plan X (Fire)	6.00%	
		Plan J-(OHCD)	6.00%	
		Plan J1 (Non Repts; Exempts)	6.00%	
		Plan J2 (DC 47; DC33: excl Guards and OHCD)	7.00%	
	SSA	Plan J5 (DC33-Guards) Eff 11/14/2014	Greater of 6% or 50% of Agregate Normal Cost of all members in Plan J (6.11%)	6.11%
		Plan J3 (Non Repts-Exempts: excluding Auditing (Controller) Department who are not in Civil Service)		4.75%
		Plan J4 (DC 47-DC33:excl Guards)		4.75%
		Plan J6 (Non Civil Service-Auditing Dept EE)		4.75%
		Plan J7 (DC33-Guard)	Greater of 3.75% or 50% of Agregate Normal Cost of all members in Plan J (6.11%)	6.11%
Plan 87	Plan A (Fire)		5.00%	
	Plan B (Police)		5.00%	
	Plan L (Elected)		9.46%	
	Plan Y		3.14%	
	Plan Y5		4.60%	
	Plan L8		12.38%	
	Plan Y2 (Non Repts-Exempts:excl Auditing EEs)		3.14%	
	Plan Y3 (DC 47-DC33:excl Guards and OHCD)		3.14%	
	Plan Y4 (Exempts-Auditing/Controller Dept Ees)		3.14%	
	Plan Y12 (DC33: Guards) Eff 11/14/2014	50% of Agregate Normal Cost of all members in Plan Y	3.46%	
Plan 87 Prime	Opted out of Plan 10	Plan Y1 (Deputy Sheriff) DOH>=1/1/12	50% of Agregate Normal Cost of all members in Plan Y	3.46%
		Plan Y4 (Non Repts) DOH>=5/14/14	+1%	4.14%
		Plan Y6 (DC 47) DOH>=3/5/2014	+1%	4.14%
		Plan Y9 (DC33-excluding Guards and OHCD) DOH>=9/9/2014	+1%	4.14%
		Plan Y11 (Exempts) DOH>=11/14/2014	+1%	4.14%
		Plan Y5.1(5 yr vesting-Exempts) DOH>=11/14/2014	+1%	5.60%
		Plan L1 (elected) DOH>=11/14/2014	+1%	10.46%
		Plan L8.1 (Elected) DOH>=11/14/2014	+1%	13.38%
		Plan B6 (Police) DOH>=1/1/2010	FIXED	6.00%
		Plan A6 (Fire) DOH>=10/15/2010	FIXED	6.00%
Plan 10	B10-Fire	FIXED	5.50%	
	A10-Police	FIXED	5.50%	
	Y10	50% of Normal Cost for members of Plan 10		
	Deputy Sheriff		3.10%	
	Register of Wills-MANDATORY DOH>=1/1/12		3.10%	
	Non-Reps		3.10%	
	DC33-Guards-MANDATORY DOH>=Eff 11/14/2014		3.10%	
DC33	3.10%			
DC 47	3.10%			
Elected	3.10%			
Exempts	3.28%			

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.

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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.