

The Police and Fire Retirement System of the City of Detroit

GASB Statement Nos. 67 and 68 Accounting and
Financial Reporting for Pension Plans of

Component II

June 30, 2019



October 15, 2019

Board of Trustees
The Police and Fire Retirement System
of the City of Detroit

Dear Board Members:

This report provides information required for the Police and Fire Retirement System of the City of Detroit in connection with the Governmental Accounting Standards Board (GASB) Statement No. 67 “Financial Reporting for Pension Plans” and No. 68 “Employer Reporting for Pension Plans.” These calculations have been made on a basis that is consistent with our understanding of these Statements. This information is subject to review of the City’s and the System’s Auditor. Please let us know if the City’s or the System’s Auditor recommends any changes. This report covers the Police and Fire Retirement System Plan known as Component II (also known as the Legacy Plan). Since Component I is a separate plan, it is detailed in a separate report.

Our calculation of the liability associated with the benefits described in this report was performed for the purpose of satisfying the requirements of GASB Statement Nos. 67 and 68. The calculation of the plan’s liability for this report is not applicable for funding purposes of the plan. A calculation of the plan’s liability for purposes other than satisfying the requirements of GASB Statement Nos. 67 and 68 may produce significantly different results. This report may be provided to parties other than the System only in its entirety and only with the permission of the Board. GRS is not responsible for unauthorized use of this report.

This report is based upon information, furnished to us by System staff, concerning retirement and ancillary benefits, active members, deferred vested members, retirees and beneficiaries, and financial data. This report is based on the valuation date of June 30, 2018. The total pension liability was rolled-forward from the valuation date to the plan year ending June 30, 2019 using generally accepted actuarial principles. The asset information as of June 30, 2019 was provided by the System. This information was checked for internal consistency, but it was not audited by GRS. A description of the adjustments made to the data is included in this report (either directly or by reference). GRS is not responsible for the accuracy of the member or financial data. As discussed in the June 30, 2018 funding valuation report, certain data was not available in time to produce the results in that report and it was necessary for us to use approximations. Please see the related discussion in the Comments section as well as the Data section of that report.

At the direction of the System and with approval of the System's Auditor, the long-term expected return on assets used to determine the discount rate is 7.19% as of June 30, 2019, the same rate used as of June 30, 2018. We have reviewed this assumption based on the System's asset allocation and have determined it to be reasonable for purposes of the measurement being taken.

The benefit provisions reflected in this valuation for the development of the end of year Total Pension Liability (TPL) are those in effect for Component II as of the end of the plan year on June 30, 2019. In particular, this report reflects a change in DROP provisions for DPLSA members, increasing the maximum DROP period from 5 years to 10 years.

To the best of our knowledge, the information contained within this report is accurate and fairly represents the actuarial position of the System on the measurement date for purposes of GASB Statement Nos. 67 and 68 reporting. All calculations have been made in conformity with generally accepted actuarial principles and practices as well as with the Actuarial Standards of Practice issued by the Actuarial Standards Board.


The signing individuals are independent of the plan sponsor.

David T. Kausch and Judith A. Kermans are Members of the American Academy of Actuaries (MAAA) and meet the Qualification Standards of the American Academy of Actuaries to render the actuarial opinions contained herein.


Respectfully submitted,



David T. Kausch, FSA, EA, FCA, MAAA, PhD
Senior Consultant and Chief Actuary



Judith A. Kermans, EA, FCA, MAAA
Senior Consultant and President



Kenneth G. Alberts
Consultant

DTK/JAK/KGA:rmn

Table of Contents

Page

Section A	Executive Summary	
	Executive Summary.....	1
	Discussion.....	2
Section B	Financial Statements	
	Statement of Fiduciary Net Position	8
	Statement of Changes in Fiduciary Net Position	9
	Statement of Pension Expense	10
	Statement of Outflows and Inflows Arising from Current Reporting Period	11
	Statement of Outflows and Inflows Arising from Current and Prior Reporting Periods	12
	Recognition of Deferred Outflows and Inflows of Resources.....	13
Section C	Required Supplementary Information	
	Schedule of Changes in Net Pension Liability and Related Ratios Current Period	14
	Schedule of Changes in Net Pension Liability and Related Ratios Multiyear	15
	Schedule of Net Pension Liability Multiyear	16
	Schedule of Contributions Multiyear	17
	Notes to Schedule of Contributions.....	18
	Schedule of Investment Returns.....	18
Section D	Notes to Financial Statements	
	Notes to Financial Statements	19
	Sensitivity of Net Pension Liability to the Single Discount Rate Assumption	19
	Additional Notes	20
Section E	Summary of Benefits	21
Section F	Actuarial Cost Method and Actuarial Assumptions	
	Actuarial Assumptions, Input to Discount Rates, Mortality Assumptions, and Experience Studies	24
	Miscellaneous and Technical Assumptions	28
Section G	Calculation of the Single Discount Rate	
	Calculation of the Single Discount Rate at End of Year	31
	Projection of Contributions (SDR).....	33
	Projection of Plan Fiduciary Net Position (SDR).....	35
	Present Values of Projected Benefits (SDR).....	37
	Projection of Plan Net Position and Benefit Payments (SDR).....	39
Section H	Glossary of Terms	40

SECTION A

EXECUTIVE SUMMARY

Executive Summary as of June 30, 2019

Actuarial Valuation Date	June 30, 2018
Measurement Date of the Net Pension Liability	June 30, 2019
Employer's Fiscal Year Ending Date (GASB No. 68 Reporting Date)	June 30, 2019

Membership

Number of	
- Retirees and Beneficiaries	8,151
- DROP Members	694
- Inactive, Nonretired Members	410
- Active Members	1,752
- Total	11,007
Covered Payroll	\$ 111,407,220

Net Pension Liability

Total Pension Liability	\$ 3,669,742,652
Plan Fiduciary Net Position	2,670,843,356
Net Pension Liability	\$ 998,899,296
Plan Fiduciary Net Position as a Percentage of Total Pension Liability	72.78%
Net Pension Liability as a Percentage of Covered Payroll	896.62%

Development of the Single Discount Rate

Single Discount Rate	7.19%
Long-Term Expected Rate of Investment Return	7.19%
Long-Term Municipal Bond Rate*	3.13%
Last year ending June 30 in the 2020 to 2119 projection period for which projected benefit payments are fully funded	2119

Total Pension Expense \$ 118,402,882

Deferred Outflows and Deferred Inflows of Resources by Source to be Recognized in Future Pension Expenses

	Deferred Outflows of Resources	Deferred Inflows of Resources
Difference between expected and actual experience	\$ -	\$ -
Changes in assumptions	-	-
Net difference between projected and actual earnings on pension plan investments	118,087,919	56,423,759
Total	\$ 118,087,919	\$ 56,423,759

**Source: Fixed-income municipal bonds with 20 years to maturity that include only federally tax-exempt municipal bonds as reported in Fidelity Index's "20-Year Municipal GO AA Index" as of June 28, 2019. In describing this index, Fidelity notes that the municipal curves are constructed using option-adjusted analytics of a diverse population of over 10,000 tax-exempt securities.*

Discussion

Changes to the Actuarial Assumptions

There were no changes in actuarial assumptions other than those discussed with the changes to benefit provisions. For purposes of determining the Total Pension Liability (TPL) as of June 30, 2019, we noted the following differences from the June 30, 2018 funding valuation:

- At the direction of the System and approval of the Systems' Auditor, the long-term expected return on assets was 7.19% as of June 30, 2019, unchanged from the rate used for June 30, 2018 GASB reporting. It was 6.75% in the June 30, 2018 funding valuation, as required by the Plan of Adjustment.
- The excess of the Annuity Reserve Fund (ARF) over the related accrued liabilities was not included as a liability in this report (see page 7).
- There was an administrative change involving the allocation of administrative expenses between Component I and Component II. Administrative expenses are now shared 60% with Component II and 40% with Component I. This change was reflected in our modeling, where appropriate.
- The June 30, 2018 funding valuation included approximately \$2.9 million in liabilities to account for excess Annuity Savings Fund (ASF) earnings that are expected to be transferred to Component I after the valuation date. In accordance with the Plan's Auditor's prior instructions, that activity is not reflected in the TPL and will be reflected in the assets, once it occurs.

Changes to the Benefit Provisions

We understand that new DROP plan provisions have been adopted. The new provisions allow DPLSA (Detroit Police Lieutenants and Sergeants Association) members to participate in the DROP program for a maximum of 10 years, up from the prior maximum of 5 years. We modeled this change by changing the DROP duration period and other assumptions for this group. For eligible DPLSA members, it was assumed that 65% of members would DROP and would stay in DROP for an average of seven (7) years. The change in the DROP provision combined with the corresponding change in the DROP assumption resulted in a \$3 million decrease in the TPL.

Discussion

Accounting Standard

For pension plans that are administered through trusts or equivalent arrangements, Governmental Accounting Standards Board (GASB) Statement No. 67 establishes standards of financial reporting for separately issued financial reports and specifies the required approach for measuring the pension liability. Similarly, GASB Statement No. 68 establishes standards for state and local government employers (as well as non-employer contributing entities) to account for and disclose the net pension liability, pension expense, and other information associated with providing retirement benefits to their employees (and former employees) on their basic financial statements.

The following discussion provides a summary of the information that is required to be disclosed under these accounting standards. A number of these disclosure items are provided in this report. However, certain information, such as notes regarding accounting policies and investments, is not included in this report and the retirement system and/or plan sponsor will be responsible for preparing and disclosing that information to comply with these accounting standards.

Financial Statements

GASB Statement No. 68 requires state or local governments to recognize the net pension liability and the pension expense on their financial statements. The net pension liability is the difference between the total pension liability and the plan's fiduciary net position. In traditional actuarial terms, this is analogous to the accrued liability less the market value of assets (not the smoothed actuarial value of assets that is often encountered in actuarial valuations performed to determine the employer's contribution requirement).

Paragraph 57 of GASB Statement No. 68 states, "Contributions to the pension plan from the employer subsequent to the measurement date of the collective net pension liability and before the end of the employer's reporting period should be reported as a deferred outflow of resources related to pensions." The information contained in this report does not incorporate any contributions made to the Police and Fire Retirement System of the City of Detroit subsequent to the measurement date of June 30, 2019.

The pension expense recognized each fiscal year is equal to the change in the net pension liability from the beginning of the year to the end of the year, adjusted for deferred recognition of the liability and investment experience.

Pension plans that prepare their own, stand-alone financial statements are required to present two financial statements – a statement of fiduciary net position and a statement of changes in fiduciary net position in accordance with GASB Statement No. 67. The statement of fiduciary net position presents the assets and liabilities of the pension plan at the end of the pension plan's reporting period. The statement of changes in fiduciary net position presents the additions, such as contributions and investment income, and deductions, such as benefit payments and expenses, and net increase or decrease in the fiduciary net position.

Discussion

Notes to Financial Statements

GASB Statement No. 68 requires the notes of the employer's financial statements to disclose the total pension expense, the pension plan's liabilities and assets, and deferred outflows of resources and inflows of resources related to pensions.

Both GASB Statements, No. 67 and No. 68 require the notes of the financial statements for the employers and pension plans to include certain additional information. The list of disclosure items should include:

- a description of the types of benefits provided by the plan, as well as automatic or ad hoc COLAs;
- the number and classes of employees covered by the benefit terms;
- for the current year, sources of changes in the net pension liability;
- significant assumptions and methods used to calculate the total pension liability;
- inputs to the Single Discount Rate;
- certain information about mortality assumptions and the dates of experience studies;
- the date of the valuation used to determine the total pension liability;
- information about changes of assumptions or other inputs and benefit terms;
- the basis for determining contributions to the plan, including a description of the plan's funding policy, as well as member and employer contribution requirements;
- the total pension liability, fiduciary net position, net pension liability, and the pension plan's fiduciary net position as a percentage of the total pension liability;
- the net pension liability using a discount rate that is 1% higher and 1% lower than used to calculate the total pension liability and net pension liability for financial reporting purposes;
- a description of the system that administers the pension plan; and
- a description of the terms of the plan's Deferred Retirement Option Program (DROP) and the total DROP balance for those members currently participating in the DROP. ***Current DROP balances for members of this plan are not available and are not included. These balances are also excluded from the reported assets.***

Retirement Systems that issue stand-alone financial statements are required to disclose additional information in accordance with GASB Statement No. 67. This information includes:

- the composition of the pension plan's Board and the authority under which benefit terms may be amended;
- the pension plan's investment policies;
- the portion of present value of benefits to be provided through the pension plan to current active and inactive plan members;
- a description of how fair value is determined; and
- information regarding certain reserves and investments, which include concentrations of investments greater than or equal to 5%, receivables, and insurance contracts excluded from plan assets.

Discussion

Required Supplementary Information

GASB Statement No. 67 requires a 10-year fiscal history of:

- sources of changes in the net pension liability;
- information about the components of the net pension liability and related ratios, including the pension plan's fiduciary net position as a percentage of the total pension liability, and the net pension liability as a percent of covered-employee payroll;
- comparison of the actual employer contributions to the actuarially determined contributions based on the plan's funding policy; and
- the annual money-weighted rate of return on pension plan investments for each year.

While the first two tables may be built prospectively as the information becomes available, sufficient information may currently be available for the third table from prior financial statements.

Timing of the Valuation

An actuarial valuation to determine the total pension liability is required to be performed at least every two years. For the employer's financial reporting purposes, the net pension liability and pension expense should be measured as of the employer's "measurement date" which may not be earlier than the employer's prior fiscal year-end date. If the actuarial valuation used to determine the total pension liability is not calculated as of the measurement date, the total pension liability is required to be rolled forward from the actuarial valuation date to the measurement date.

The total pension liability shown in this report is based on an actuarial valuation performed as of June 30, 2018 rolled-forward to the plan year end of June 30, 2019.

Single Discount Rate

Projected benefit payments are required to be discounted to their actuarial present values using a Single Discount Rate that reflects (1) a long-term expected rate of return on pension plan investments (to the extent that the plan's fiduciary net position is projected to be sufficient to pay benefits) and (2) tax-exempt municipal bond rate based on an index of 20-year general obligation bonds with an average AA credit rating as of the measurement date (to the extent that the contributions for use with the long-term expected rate of return are not met).

For the purpose of this valuation, the expected rate of return on pension plan investments is 7.19%; the municipal bond rate is 3.13% (based on the "20-Year Municipal GO AA Index" from the Fidelity Index); and the resulting Single Discount Rate is 7.19% as of June 30, 2019.

The projection of contributions used to determine this Single Discount Rate reflect that plan member contributions ceased prior to June 30, 2018 and that employer contributions will be made at rates equal to those set by the final Plan of Adjustment through June 30, 2023 and a 30-year closed level dollar amortization thereafter. Based on these assumptions, the pension plan's fiduciary net position was projected to be available to make all projected future benefit payments of current plan members.

Discussion

Therefore, the long-term expected rate of return on pension plan investments of 7.19% was applied to all periods of projected benefit payments to determine the total pension liability. Note projections are shown with a 7.19% investment return (the current long-term expected rate provided by the Retirement System).

Note the projections show assets continuing to grow after the satisfaction of liabilities. This is a byproduct of the way in which the Contingency Reserve (the excess of ARF over annuity liabilities) is handled in the valuation. See Contingency Reserve comment for additional details.

The 30-year period, beginning July 1, 2023, was chosen to illustrate the projection of net plan position due to its use in the City's 40-year forecasting included in the Plan of Adjustment, the State requirements under the Michigan Constitution, and the Public Employees Retirement System Investment Act (PERSIA). There have been a number of changes resulting from the Bankruptcy and the Board is in the process of establishing a funding policy. The amortization method used in the projections is unchanged from the June 30, 2018 GASB Statement Nos. 67 and 68 reports.

Limitation of Assets as a Percent of Total Pension Liability Measurements

This report includes a measure of the plan fiduciary net position as a percent of total pension liability (72.78% as of June 30, 2019). Unless otherwise indicated, with regard to any such measurements presented in this report:

- (1) This measurement is not intended to be a funded ratio or a measure of funded progress.
- (2) This measurement is inappropriate for assessing the sufficiency of Plan assets to cover the estimated cost of settling the Plan's benefit obligations.
- (3) The measurement is inappropriate for assessing the need for or amount of future employer contributions.

Limitations of Project Scope

Actuarial Standards do not require the actuary to evaluate the ability of the plan sponsor or other contributing entities to make required contributions when due. Such an evaluation was not within the scope of this project and is not within our area of expertise. Consequently, we have not made such an evaluation.

Plan

The Police and Fire Retirement System has two components. It is our understanding that Component I and Component II are separate plans and the assets from one plan cannot be used to satisfy the liabilities of the other, even though assets may be pooled for investment purposes and transfers may be required by the plan document in certain circumstances. Therefore, this report only includes the liabilities and reported assets of Component II. The liabilities and reported assets of Component I will be detailed in a separate report.

Discussion

Contingency Reserve

Historically, the Retirement Board has included a contingency reserve in the development of the accrued liabilities equal to the difference between the annuity liabilities and the Annuity Reserve Fund (when the Annuity Reserve Fund exceeds the annuity liabilities). Neither GASB Statements No. 67 nor 68 seem to address this situation directly. However, question 23 of the GASB Statement No. 67 implementation guide addresses a closely related issue. Based on that guidance, we believe the TPL should not include the Contingency Reserve and have, therefore, removed it.

The Contingency Reserve may still need to be disclosed in accordance with paragraph 30(e). If so, the amount of the reserve is \$26,017,157 as of June 30, 2018. The projections in Section G show the Net Plan Position as of June 30, 2019 with and without the remaining contingency reserve. If the contingency reserve is removed from the liabilities and those assets are never to be paid out, they will continue to grow with interest.

SECTION B

FINANCIAL STATEMENTS

This information is subject to review by the City's and the System's Auditor. Please let us know if there are any recommended changes.

Statement of Fiduciary Net Position as of June 30, 2019

Assets

Cash and Cash Equivalents	\$	57,654,902
Receivables	\$	99,739,032
Investments		
Investments at Fair Value	\$	2,610,224,281
Cash and Investments held as Collateral for Securities Lending		200,383,824
Capital Assets - Net		1,198,468
Total Investments	\$	<u>2,811,806,573</u>
Total Assets	\$	<u><u>2,969,200,507</u></u>

Liabilities

Payables		
Accounts Payable	\$	298,357,151
Total Liabilities	\$	<u><u>298,357,151</u></u>
Net Position Restricted for Pensions	\$	<u><u>2,670,843,356</u></u>

Statement of Changes in Fiduciary Net Position for Year Ended June 30, 2019

Additions

Contributions	
Employer	\$ 18,300,000
Employee	3,600
Other	-
Total Contributions	<u>\$ 18,303,600</u>
Investment Income	
Investment Income	\$ 92,292,856
Annuity Interest	6,269,761
Annuity Loan Interest	329,277
Net Investment Income	<u>\$ 98,891,894</u>
Other	<u>\$ 166,815</u>
Total Additions	<u><u>\$ 117,362,309</u></u>

Deductions

Benefit Payments, including Refunds of Employee Contributions	\$ 305,611,683
Pension Plan Administrative Expense	3,180,514
Transfers Out	4,030,561
Total Deductions	<u>\$ 312,822,758</u>
Net Increase in Net Position	\$ (195,460,449)

Net Position Restricted for Pensions

Beginning of Year	\$ 2,866,303,805
End of Year	<u><u>\$ 2,670,843,356</u></u>

Statement of Pension Expense Under GASB Statement No. 68

Fiscal Year Ended June 30, 2019

A. Expense

1. Service Cost	\$	-
2. Interest on the Total Pension Liability		256,873,504
3. Current-Period Benefit Changes		(3,111,623)
4. Employee Contributions (made negative for addition here)		(3,600)
5. Projected Earnings on Plan Investments (made negative for addition here)		(195,505,277)
6. Pension Plan Administrative Expense		3,180,514
7. Other Changes in Plan Fiduciary Net Position		3,863,746
8. Recognition of Outflow (Inflow) of Resources due to Liabilities		(3,862,962)
9. Recognition of Outflow (Inflow) of Resources due to Assets		56,968,580
10. Total Pension Expense	\$	118,402,882

Statement of Outflows and Inflows Arising from Current Reporting Period Fiscal Year Ended June 30, 2019

A. Outflows (Inflows) of Resources due to Liabilities

1. Difference between expected and actual experience of the Total Pension Liability (gains) or losses	\$ (3,862,962)
2. Assumption Changes (gains) or losses	\$ -
3. Recognition period for Liabilities: Average of the expected remaining service lives of all employees {in years}*	1.0000
4. Outflow (Inflow) of Resources to be recognized in the current pension expense for the difference between expected and actual experience of the Total Pension Liability	\$ (3,862,962)
5. Outflow (Inflow) of Resources to be recognized in the current pension expense for Assumption Changes	\$ -
6. Outflow (Inflow) of Resources to be recognized in the current pension expense due to Liabilities	<u>\$ (3,862,962)</u>
7. Deferred Outflow (Inflow) of Resources to be recognized in future pension expenses for the difference between expected and actual experience of the Total Pension Liability	\$ -
8. Deferred Outflow (Inflow) of Resources to be recognized in future pension expenses for Assumption Changes	\$ -
9. Deferred Outflow (Inflow) of Resources to be recognized in future pension expenses due to Liabilities	<u>\$ -</u>

B. Outflows (Inflows) of Resources due to Assets

1. Net difference between projected and actual earnings on pension plan investments (gains) or losses	\$ 96,613,383
2. Recognition period for Assets {in years}	5.0000
3. Outflow (Inflow) of Resources to be recognized in the current pension expense due to Assets	\$ 19,322,677
4. Deferred Outflow (Inflow) of Resources to be recognized in future pension expenses due to Assets	<u>\$ 77,290,706</u>

* A 1-year period (immediate recognition) is used, since the Plan is closed and no benefits are accruing and, therefore, future participation service is zero.

Statement of Outflows and Inflows Arising from Current and Prior Reporting Periods Fiscal Year Ended June 30, 2019

A. Outflows and Inflows of Resources due to Liabilities and Assets to be Recognized in Current Pension Expense

	Outflows of Resources	Inflows of Resources	Net Outflows of Resources
1. Due to Liabilities	\$ -	\$ 3,862,962	\$ (3,862,962)
2. Due to Assets	81,279,717	24,311,137	56,968,580
3. Total	\$ 81,279,717	\$ 28,174,099	\$ 53,105,618

B. Outflows and Inflows of Resources by Source to be Recognized in Current Pension Expense

	Outflows of Resources	Inflows of Resources	Net Outflows of Resources
1. Differences between expected and actual experience	\$ -	\$ 3,862,962	\$ (3,862,962)
2. Assumption Changes	-	-	-
3. Net Difference between projected and actual earnings on pension plan investments	81,279,717	24,311,137	56,968,580
4. Total	\$ 81,279,717	\$ 28,174,099	\$ 53,105,618

C. Deferred Outflows and Deferred Inflows of Resources by Source to be Recognized in Future Pension Expenses

	Deferred Outflows of Resources	Deferred Inflows of Resources	Net Deferred Outflows of Resources
1. Differences between expected and actual experience	\$ -	\$ -	\$ -
2. Assumption Changes	-	-	-
3. Net Difference between projected and actual earnings on pension plan investments	118,087,919	56,423,759	61,664,160
4. Total	\$ 118,087,919	\$ 56,423,759	\$ 61,664,160

D. Deferred Outflows and Deferred Inflows of Resources by Year to be Recognized in Future Pension Expenses

Year Ending June 30	Net Deferred Outflows of Resources
2020	\$ 35,808,753
2021	(4,988,461)
2022	11,521,193
2023	19,322,675
2024	-
Thereafter	-
Total	\$ 61,664,160

Recognition of Deferred Outflows and Inflows of Resources

Fiscal Year Ended June 30, 2019

Year Established	Initial Amount	Initial Recognition Period	Current Year Recognition	Remaining Recognition	Remaining Recognition Period
Deferred Outflow (Inflow) due to Differences Between Expected and Actual Experience on Liabilities					
2015	\$ (59,621,651)	1.0000	\$ 0	\$ 0	0.0000
2016	45,955,554	1.0000	0	0	0.0000
2017	(10,648,606)	1.0000	0	0	0.0000
2018	32,674,674	1.0000	0	0	0.0000
2019	(3,862,962)	1.0000	(3,862,962)	0	0.0000
Total			\$ (3,862,962)	\$ 0	
Deferred Outflow (Inflow) due to Assumption Changes					
2015	\$ (95,014,469)	1.0000	\$ 0	\$ 0	0.0000
2016	114,463,362	1.0000	0	0	0.0000
2017	(4,082,068)	1.0000	0	0	0.0000
2018	(6,975,457)	1.0000	0	0	0.0000
2019	0	1.0000	0	0	0.0000
Total			\$ 0	\$ 0	
Deferred Outflow (Inflow) due to Differences Between Projected and Actual Earnings on Plan Investments					
2015	\$ 105,799,133	5.0000	\$ 21,159,825	\$ 0	0.0000
2016	203,986,073	5.0000	40,797,215	40,797,213	1.0000
2017	(82,548,261)	5.0000	(16,509,652)	(33,019,305)	2.0000
2018	(39,007,424)	5.0000	(7,801,485)	(23,404,454)	3.0000
2019	96,613,383	5.0000	19,322,677	77,290,706	4.0000
Total			\$ 56,968,580	\$ 61,664,160	

SECTION C

REQUIRED SUPPLEMENTARY INFORMATION

Schedule of Changes in Net Pension Liability and Related Ratios

Current Period

Fiscal Year Ended June 30, 2019

A. Total pension liability	
1. Service Cost	\$ -
2. Interest on the Total Pension Liability	256,873,504
3. Changes of benefit terms	(3,111,623)
4. Difference between expected and actual experience of the Total Pension Liability	(3,862,962)
5. Changes of assumptions	0
6. Benefit payments, including refunds of employee contributions	(305,611,683)
7. Net change in total pension liability	<u>\$ (55,712,764)</u>
8. Total pension liability – beginning	<u>3,725,455,416</u>
9. Total pension liability – ending	<u><u>\$ 3,669,742,652</u></u>
B. Plan fiduciary net position	
1. Contributions – employer	\$ 18,300,000
2. Contributions – employee	3,600
3. Net investment income	98,891,894
4. Benefit payments, including refunds of employee contributions	(305,611,683)
5. Pension plan administrative expense	(3,180,514)
6. Other	(3,863,746)
7. Net change in plan fiduciary net position	<u>\$ (195,460,449)</u>
8. Plan fiduciary net position – beginning	<u>2,866,303,805</u>
9. Plan fiduciary net position – ending	<u><u>\$ 2,670,843,356</u></u>
C. Net pension liability	<u><u>\$ 998,899,296</u></u>
D. Plan fiduciary net position as a percentage of the total pension liability	72.78%
E. Covered-employee payroll	\$ 111,407,220
F. Net pension liability as a percentage of covered-employee payroll	896.62%

A Special Funding Situation may occur if a non-city entity has a legal obligation to contribute directly to the Retirement System. The Net Pension Liability shown here has not been adjusted for any potential special funding situation. Our understanding is that the City makes all the employer contributions into the fund, even though the City may receive monies from other entities as a result of the POA.

Schedules of Required Supplementary Information

Schedule of Changes in Net Pension Liability and Related Ratios Multiyear

Fiscal year ending June 30,	Ultimately 10 Fiscal Years will be Displayed					
	2019	2018	2017	2016	2015	2014
Total Pension Liability						
Service Cost	\$ -	\$ -	\$ -	\$ -	\$ -	\$ 34,967,708
Interest on the Total Pension Liability	256,873,504	257,841,119	261,449,503	264,233,822	306,063,331	304,737,368
Benefit Changes	(3,111,623)	-	-	-	(555,898,068)	(102,236,878)
Difference between Expected and Actual Experience	(3,862,962)	32,674,674	(10,648,606)	45,955,554	(59,621,651)	-
Assumption Changes*	-	(6,975,457)	(4,082,068)	114,463,362	(95,014,469)	540,356,835
Benefit Payments	(286,557,514)	(288,443,573)	(286,667,369)	(285,936,674)	(313,816,916)	(285,512,629)
Refunds	(19,054,169)	(19,947,151)	(19,431,502)	(18,530,489)	-	(38,027,844)
Net Change in Total Pension Liability	(55,712,764)	(24,850,388)	(59,380,042)	120,185,575	(718,287,774)	454,284,561
Total Pension Liability - Beginning	3,725,455,416	3,750,305,804	3,809,685,846	3,689,500,271	4,407,788,045	3,953,503,484
Total Pension Liability - Ending (a)	\$ 3,669,742,652	\$ 3,725,455,416	\$ 3,750,305,804	\$ 3,809,685,846	\$ 3,689,500,271	\$ 4,407,788,045
Plan Fiduciary Net Position						
Employer Contributions	\$ 18,300,000	\$ 18,300,000	\$ 18,300,000	\$ 37,787,744	\$ 114,300,000	\$ -
Employee Contributions	3,600	42,114	14,055	24,801	42,576	7,783,141
Pension Plan Net Investment Income	98,891,894	237,991,220	282,398,412	24,649,809	122,736,820	568,760,793
Benefit Payments	(286,557,514)	(288,443,573)	(286,667,369)	(285,936,673)	(313,816,916)	(285,512,629)
Refunds	(19,054,169)	(19,947,151)	(19,431,502)	(18,530,489)	-	(38,027,844)
Pension Plan Administrative Expense	(3,180,514)	(4,933,928)	(4,433,657)	(3,103,694)	(7,630,692)	(11,373,226)
Other	(3,863,746)	1,153,145	(18,508,411)	824,511	2,919,354	-
Net Change in Plan Fiduciary Net Position	(195,460,449)	(55,838,173)	(28,328,472)	(244,283,991)	(81,448,858)	241,630,235
Plan Fiduciary Net Position - Beginning	2,866,303,805	2,922,141,978	2,950,470,450	3,194,754,441	3,276,203,299	3,034,573,064
Plan Fiduciary Net Position - Ending (b)	\$ 2,670,843,356	\$ 2,866,303,805	\$ 2,922,141,978	\$ 2,950,470,450	\$ 3,194,754,441	\$ 3,276,203,299
Net Pension Liability - Ending (a) - (b)	998,899,296	859,151,611	828,163,826	859,215,396	494,745,830	1,131,584,746
Plan Fiduciary Net Position as a Percentage						
of Total Pension Liability	72.78 %	76.94 %	77.92 %	77.45 %	86.59 %	74.33 %
Covered Employee Payroll (excluding DROP)	\$ 111,407,220	\$ 116,288,356	\$ 126,865,176	\$ 134,758,956	\$ 132,566,687	\$ 150,176,596
Net Pension Liability as a Percentage						
of Covered Employee Payroll	896.62 %	738.81 %	652.79 %	637.59 %	373.21 %	753.50 %

Notes to Schedule:

* For the fiscal years ending 2016, 2017 and 2018, the "Assumption Changes" item only includes the effect of the change in the SDR. All other changes to the actuarial assumptions and methods are included in the "Difference between Expected and Actual Experience" line or the benefit changes line.

A Special Funding Situation may occur if a non-city entity has a legal obligation to contribute directly to the Retirement System. The Net Pension Liability shown here has not been adjusted for any potential special funding situation. Our understanding is that the City makes all the employer contributions into the fund, even though the City may receive monies from other entities as a result of the POA.

Schedules of Required Supplementary Information

Schedule of the Net Pension Liability Multiyear

Ultimately 10 Fiscal Years will be Displayed

FY Ending June 30,	Total Pension Liability	Plan Net Position	Net Pension Liability	Plan Net Position as a % of Total Pension Liability	Covered Payroll*	Net Pension Liability as a % of Covered Payroll
2014	\$ 4,407,788,045	\$ 3,276,203,299	\$ 1,131,584,746	74.33%	\$ 150,176,596	753.50%
2015	3,689,500,271	3,194,754,441	494,745,830	86.59%	132,566,687	373.21%
2016	3,809,685,846	2,950,470,450	859,215,396	77.45%	134,758,956	637.59%
2017	3,750,305,804	2,922,141,978	828,163,826	77.92%	126,865,176	652.79%
2018	3,725,455,416	2,866,303,805	859,151,611	76.94%	116,288,356	738.81%
2019	3,669,742,652	2,670,843,356	998,899,296	72.78%	111,407,220	896.62%

* Covered payroll shown is the reported payroll on the actuarial valuation date (census date). Actual covered payroll paid during the year was unavailable. Covered payroll for this purpose excludes DROP member payroll.

Schedule of Contributions Multiyear

FY Ending June 30,	Actuarially Determined Contribution#	Actual Contribution	Contribution Deficiency (Excess)	Covered Payroll	Actual Contribution as a % of Covered Payroll
2014	\$ 62,954,305	\$ -	\$ 62,954,305	\$ 186,694,166 *	0.00%
2015	N/A	114,300,000	N/A	132,566,687	86.22%
2016	N/A	37,787,744	N/A	134,758,956	28.04%
2017	N/A	18,300,000	N/A	126,865,176	14.42%
2018	N/A	18,300,000	N/A	116,288,356	15.74%
2019	N/A	18,300,000	N/A	111,407,220	16.43%

* Includes DROP members, consistent with Plan Funding.

Beginning with FY 2015, employer contributions are set forth in the POA through 2023 and are not actuarially determined. Employer contributions will again be actuarially determined in FY 2024 and beyond.

Notes to Schedule of Contributions

Contribution Requirement: The expected contributions for fiscal year 2015 and beyond are provided in the POA. A contribution schedule showing future contribution requirements is below.

Fiscal Year	Contribution (Millions)
2020	\$ 18.3
2021	18.3
2022	18.3
2023	18.3

Beginning with Fiscal Year 2024, employer contributions will be actuarially determined.

Schedule of Investment Returns

This information should be provided by the Plan's investment consultant.

SECTION D

NOTES TO FINANCIAL STATEMENTS

Notes to Financial Statements

Single Discount Rate

A Single Discount Rate of 7.19% was used to measure the total pension liability as of June 30, 2019. This Single Discount Rate was based on the expected rate of return on pension plan investments of 7.19% as directed by the System and the System's Auditor. The projection of cash flows used to determine this Single Discount Rate assumed that plan member contributions will cease as of June 30, 2019 and that employer contributions will be made at rates equal to those set by the final Plan of Adjustment through June 30, 2023 and the System's funding policy thereafter. Based on these assumptions, the pension plan's fiduciary net position was projected to be available to make all projected future benefit payments of current plan members. Therefore, the long-term expected rate of return on pension plan investments was applied to all periods of projected benefit payments to determine the total pension liability.

Regarding the sensitivity of the net pension liability to changes in the Single Discount Rate, the following presents the plan's net pension liability, calculated using a Single Discount Rate of 7.19%, as well as what the plan's net pension liability would be if it were calculated using a Single Discount Rate that is one percent lower or one percent higher.

Sensitivity of Net Pension Liability to the Single Discount Rate Assumption[#]

	1% Decrease 6.19%	Current Single Discount Rate Assumption 7.19%	1% Increase 8.19%
Total Pension Liability (TPL)	\$4,039,510,643	\$3,669,742,652	\$3,358,350,912
Net Position Restricted for Pensions	2,670,843,356	2,670,843,356	2,670,843,356
Net Pension Liability (NPL)	\$1,368,667,287	\$ 998,899,296	\$ 687,507,556

[#] The inclusion of discount rates shown on this required schedule does not imply the rate is reasonable (other than the current assumption).

Expected Real Returns by Asset Class

This information was not available to Gabriel, Roeder, Smith & Company for this report.

Notes to Financial Statements

Summary of Population Statistics

Inactive Plan Members or Beneficiaries Currently Receiving Benefits	8,151
DROP Members	694
Inactive Plan Members Entitled to But Not Yet Receiving Benefits	410
Active Plan Members	<u>1,752</u>
Total Plan Members	11,007

Additional information regarding the plan population may be found in the June 30, 2018 actuarial valuation of the System.

Additional Notes

As discussed in Section G-2(f) of the Combined PFRS Plan, interest on the Annuity Savings Fund (ASF) is capped. If the actual interest rate earned on the fund exceeds the cap, a portion of the excess (that would have been payable to the ASF if not for the cap) is transferred to Component I if needed to fund transition liabilities. We have assumed no future transfers of assets to Component I in this valuation. Future transfers to Component I will be recognized as they occur. If future transfers to Component I are triggered, Component II liabilities and assets will be reduced in equal amounts.

Liabilities and reported assets for Component I are not included in this report and will be detailed in a separate report.

SECTION E

SUMMARY OF BENEFITS

Summary of Frozen Benefit Provisions

Component II Frozen Benefits

All Component II benefits are frozen as of June 30, 2014 based on service and average final compensation accrued as of that date and the provisions of the Detroit Police and Fire Retirement System as it existed on June 30, 2014 and all future cost-of-living adjustments (“COLA’s”) were reduced from 2.25% to 1.0125% per year. The benefits evaluated in this report are the frozen reduced benefits. Component II benefits are payable after separation from service, upon meeting the eligibility conditions of the plan as it existed on June 30, 2014, regardless of whether the individual is eligible to receive a Component I benefit at that time.

Our understanding of the June 30, 2014 plan provisions is provided below for completeness. The material below is a non-legal summary and is not intended to cover all potential situations that could occur. If there are discrepancies between the description below, and appropriate legal documents, the latter necessarily govern.

Age and Service Retirement

Eligibility - 25 years of service regardless of age. 20 years of service regardless of age for eligible DPOA and DFFA members. DFFA members must retire by age 60.

Annual Amount - An annuity equal to the actuarial equivalent of the member’s accumulated contribution account plus a defined benefit, which, when added to the annuity will provide the following:

Pre-1969 Members - For all service earned up to April 5, 2011 for LSA and Fire equivalent members, and up to September 1, 2011 for DPOA and Fire equivalent members, 2.5% of AFC times the first 25 years of service, with a maximum allowance of 15/22 of a police officer’s or firefighter’s annual rate of compensation (actuarially reduced to reflect early payment).

For all service earned after April 5, 2011 for LSA and Fire equivalent members, and after September 1, 2011 for DPOA and Fire equivalent members, 2.1% of AFC times the first 25 years of service, with a maximum allowance of 15/22 of a police officer’s or firefighter’s annual rate of compensation.

1969 Plan Members - For all service earned up to April 5, 2011 for LSA and Fire equivalent members, and up to September 1, 2011 for DPOA and Fire equivalent members, 2.5% of AFC times the first 25 years of service plus 2.1% of AFC times each of the next 10 years of service.

For all service earned after April 5, 2011 for LSA and Fire equivalent members, and after September 1, 2011 for DPOA and Fire equivalent members, 2.1% of AFC times each year of service, up to 35 years of service.

Members may elect to receive their accumulated contribution account in a lump sum after 25 years of service (20 years of service for eligible DPOA and DFFA members). The defined benefit at retirement is then reduced by the actuarial equivalent of the amount of principal withdrawn. No reduction is made with regard to the interest portion of the withdrawal. Pre-1969 plan members may elect 1969 plan benefits at the time of retirement.

Summary of Frozen Benefit Provisions

Type of Average Final Compensation (AFC) - Average of the current compensation for the ranks held in each of last 5 years (last 3 years for DPCOA, Executive Members and their Fire equivalents). Pension benefits for non-union employees may not be diminished due to a reduction in compensation because of fiscal emergency. AFC includes prior longevity distributions during the averaging period in accordance with the following schedule: 1% of compensation after 5 years of service, 2% after 11 years, 3% after 16 years and 4% after 21 years. A member may elect that upon retirement or upon death before retirement either (i) a lump sum payment equal to 85% (100% for DPOA and DPCOA members) of the amount of his or her unused accumulated sick leave bank, or (ii) to have the 3-year average of 25% of the value of the accumulated unused sick leave bank added to his or her AFC. Any member electing the AFC adjustment option will also be paid a lump sum equal to the remaining value of the sick leave bank as provided in (i) above. Lump sum payments are not paid by the Retirement System.

Deferred Retirement (vested benefit)

Eligibility - 10 years of service for DPOA and Fire equivalents, age 40 with 8 years of service for all others.

Annual Amount - Same as regular retirement but based on average final compensation and credited service at the time of termination.

Benefit Commencement - DPOA and Fire equivalent members hired after 6/30/85: Unreduced benefit begins at age 62. **All other members:** Unreduced benefit begins at the age when the member would have first been eligible for regular retirement had the member continued in City service. **All** members may elect a reduced benefit payable immediately.

Note, for valuation purposes, the frozen accrued benefit was valued in the event of a death or disability. The following death and disability provisions are provided for historical purposes only.

Duty Disability Retirement

Eligibility - No age or service requirement.

Annual Amount – A basic benefit of 50% of final compensation as of June 30, 2014 and a supplemental benefit of 16-2/3% of final compensation as of June 30, 2014 is payable for 24 months. After 24 months, members disabled from any occupation continue to receive both benefits; otherwise, only the 50% benefit is then payable. Upon attaining 25 years of service, the disability benefit is 50% of final compensation as of June 30, 2014. Members convert to regular retirement benefit at age 65. Worker's compensation payments are offset. Members who have already filed under the old duty disability plan will receive 66-2/3% of final compensation as of June 30, 2014 payable to eligibility date for regular retirement. Benefits prior to age 65 are assumed to be paid from Component I. Benefits after age 65 are assumed to be paid from Component II (this plan).

Non-Duty Disability Retirement

Eligibility - 5 years of service.

Annual Amount - Computed as a regular retirement benefit, but based on average final compensation and credited service at the time of disability. Minimum benefit is 20% of average final compensation. Benefits are assumed to be paid from Component II (this plan).

Duty Death Before Retirement

Eligibility - No age or service requirement.

Summary of Frozen Benefit Provisions

Annual Amount - Surviving spouse receives 5/11 of police officer's or firefighter's compensation and each child under age 18 receives 1/10 of such compensation with a maximum total of 7/33 of such compensation. If there is no surviving spouse, each child receives 1/4 of such compensation with a maximum total of 1/2 of such compensation. If there is no surviving spouse or children, each dependent parent receives 1/6 of such compensation. Worker's compensation payments are offset. Benefits are assumed to be paid from Component I.

Non-Duty Death Before Retirement

Eligibility - No age or service requirement.

Annual Amount - Same as a regular retirement benefit to a surviving spouse, but reduced in accordance with a 100% joint and survivor option election. Minimum benefit is 20% of average final compensation. Each child under 18 receives 1/7 of police officer's or firefighter's compensation with a maximum total of 2/7 of such compensation. If there is no spouse or children, each dependent parent receives 1/7 of such compensation. Benefits are assumed to be paid from Component II (this plan).

Post-Retirement Cost-of-Living Adjustments

- Pre-1969 Members** - Allowances increase in proportion to active member compensation for the corresponding rank. These increases are not considered COLAs and are therefore not reduced under the POA.
- 1969 Plan Members** - Police retired after July 1, 2001, certain Police classes retired after July 1, 1998 and all Fire members: For all service earned up to April 5, 2011 for LSA members (September 1, 2011 for DPOA members) pensions increase by 2.25% of the current pension amount each July 1. No cost-of-living adjustments for service earned after April 5, 2011 for LSA members (September 1, 2011 for DPOA members). COLA is reduced by 45% according to the POA.

Member Contributions

5% of covered compensation payable until first eligible for regular retirement. Interest on member contributions provides benefits in addition to the formula benefit.

DROP Plan

Members with 25 years (20 years for DPOA members) of service may elect to participate in the DROP. When a DROP election is made, the member ceases to accrue any further age and service retirement benefits. Seventy-five percent (75%) of the member's benefit (accrued to their DROP date) is contributed to a DROP account (a defined contribution account). At retirement the member is entitled to the balance in the DROP account and a monthly benefit equal to 100% of their benefit accrued to their DROP date, increased by any post-retirement increases that the member would have received, had the member been retired. Fire members must retire from the DROP plan at age 60. Participation in the DROP is limited to 10 years for LSA members electing to DROP after April 5, 2011 and prior to July 1, 2014. Members electing DROP after July 1, 2014 are limited to 5 years of DROP participation. Effective October 31, 2018, LSA members are limited to 10 years of DROP participation.

SECTION F

ACTUARIAL COST METHOD AND ACTUARIAL ASSUMPTIONS

Summary of Assumptions Used for DPFERS Actuarial Valuation

Assumptions Adopted by Board of Trustees

After Consulting with Actuary

ASSUMPTION REVIEW

All assumptions are estimates of future experience except as noted. The rationale for the assumptions is based on experience studies unless noted otherwise.

ECONOMIC ASSUMPTIONS

For the Determination of the June 30, 2019 TPL:

The investment return rate used in the valuation was 7.19% per year, compounded annually (net after investment expenses). This assumption was provided by the Retirement System.

Price inflation is not directly used in the valuation. For purposes of assessing the reasonability of the investment return assumption we assumed price inflation of 2.50% per year.

NON-ECONOMIC ASSUMPTIONS

The mortality table used to measure retired life mortality is the RP-2014 Blue Collar Annuitant Table for males and females. Tables were extended below age 50 with a cubic spline to the published Juvenile rates. Pre-retirement mortality is the RP-2014 Blue Collar Employee Tables for males and females. The tables are projected to be fully generational, based on the 2-dimensional, sex distinct mortality improvement scale MP-2014 (which was published and intended to be used with RP-2014). This table was first used as of June 30, 2014. The rationale for the mortality assumption is based on the 2008-2013 Mortality Experience Study issued February 13, 2015.

The probabilities of age/service retirement for members eligible to retire are shown on page 26. The rationale is based on the 2002-2007 Experience Study. However, probabilities were modified effective with the June 30, 2014 valuation to reflect a change in the modeling of the future DROP members, consistent with the plan closure. The revised probabilities were selected so that, when combined with the model change, the effect on the present value of benefits would be immaterial.

The probabilities of separation from service (including death-in-service) are shown for sample ages on page 27. These probabilities were first used for the June 30, 2008 valuation. The rationale is based on the 2002-2007 Experience Study.

Data adjustments: See page 28 of the June 30, 2018 actuarial valuation issued February 7, 2019.

Single Life Retirement Values Based on RP-2014 Blue Collar for Males and Females

Sample Attained Ages in 2018	Future Life Expectancy (years)	
	Men	Women
45	39.59	42.94
50	34.61	37.87
55	29.81	32.94
60	25.23	28.17
65	20.88	23.56
70	16.83	19.19
75	13.12	15.16
80	9.84	11.56

Probabilities of Service Retirement

Service	Percent of Eligible Active Members Retiring within Next Year			
	Police		Fire	
	20 & Out	25 & Out	20 & Out	25 & Out
	19	40%		40%
20	40%		40%	
21	40%		40%	
22	40%		40%	
23	40%		40%	
24	100%	40%	100%	40%
25	100%	40%	100%	40%
26	100%	40%	100%	40%
27	100%	40%	100%	40%
28	100%	40%	100%	40%
29	100%	100%	100%	100%
30	100%	100%	100%	100%
31	100%	100%	100%	100%
32	100%	100%	100%	100%
33	100%	100%	100%	100%
34	100%	100%	100%	100%
35	100%	100%	100%	100%
36	100%	100%	100%	100%
37	100%	100%	100%	100%
38	100%	100%	100%	100%
39	100%	100%	100%	100%
40	100%	100%	100%	100%

Age	Percent of Eligible Active Members Retiring within Next Year	
	Police	Fire
60	40%	100%
61	40%	100%
62	40%	100%
63	40%	100%
64	40%	100%
65	100%	100%
66	100%	100%
67	100%	100%
68	100%	100%
69	100%	100%
70	100%	100%

Members eligible for 20 & Out are assumed to be first eligible for normal retirement after 19 years of service due to their ability (and experience) to purchase service. Members eligible for 25 & Out are assumed to be eligible for normal retirement after 24 years of service due to their ability (and experience) to purchase service. Members are also eligible to retire at age 60 with no service requirement. The rationale is based on the 2002-2007 Experience Study.

Probabilities of Separation

Sample Ages	Years of Service	% of Active Members Withdrawing within Next Year	
		Police	Fire
ALL	0	8.50%	5.00%
	1	7.50%	4.00%
	2	6.00%	3.00%
	3	5.00%	2.00%
	4	4.50%	2.00%
25	5 & Over	4.50%	1.96%
30		3.30%	1.62%
35		2.30%	1.11%
40		1.70%	0.77%
45		1.50%	0.60%
50		1.10%	0.51%
55		0.80%	0.51%
60	0.80%	0.51%	

Sample Ages	% of Active Members Becoming Disabled within Next Year			
	Police		Fire	
	Ordinary	Duty	Ordinary	Duty
25	0.06%	0.13%	0.07%	0.34%
30	0.07%	0.19%	0.08%	0.52%
35	0.08%	0.34%	0.09%	0.90%
40	0.11%	0.49%	0.12%	1.30%
45	0.16%	0.73%	0.18%	1.92%
50	0.47%	1.16%	0.53%	3.06%
55	0.73%	1.96%	0.82%	5.18%
60	0.83%	2.82%	0.94%	7.47%

The rationale is based on the 2002-2007 Experience Study.

Miscellaneous and Technical Assumptions

Marriage Assumption:	100% of males and 100% of females are assumed to be married for purposes of death-in-service benefits. This assumption accounts for potential dependent children/dependent parent death benefits. No other assumption is made for surviving children/dependent parents. Male spouses are assumed to be three years older than female spouses.
Pay Increase Timing:	N/A
Decrement Timing:	Decrements are assumed to occur mid-year.
Eligibility Testing:	Eligibility for benefits is determined based upon the age nearest birthday and service nearest whole year on the date of decrement.
Decrement Relativity:	Decrement rates are used directly from the experience study, without adjustment for multiple decrement table effects.
Decrement Operation:	Disability and mortality decrements do not operate during the first 5 years of service. Disability and withdrawal do not operate during retirement eligibility.
Incidence of Contributions:	Employer contributions are assumed to be received on the last day of the fiscal year. For purposes of determining the GASB single discount rate, all cash flows are assumed to occur mid-year.
Longevity in AFC:	Longevity payments were included directly in the AFC data provided by the System. No further adjustment was included.
Unused Sick Leave Payout:	Sick leave banks as of June 30, 2014 were included in the 2014 data file provided by the System. No further adjustment to the sick banks was included.
Administrative Expense:	3.0% of Component I payroll. 60% of the administrative expenses were allocated to Component II and 40% to Component I based on actual administrative expenses paid.
Post-Retirement COLA:	Active members are assumed to receive a 0.9% COLA rather than 1.0125% because the annuity portion is not subject to the COLA. Post-retirement increases for retired members were based on the plan in effect at retirement. For the pre-69 plan members, future COLA's are assumed to be the same as wage inflation for active members (not reduced in POA). For other members retiring before 2014, the COLA rate is prorated by the ratio of COLA eligible service to total service at retirement before applying the POA mandated reduction to 1.0125%. The service ratio is provided on the data file.
AFC Period:	AFC data was provided by the System for the June 30, 2014 (date of freeze) valuation.

Miscellaneous and Technical Assumptions (Continued)

Disability Change Age:	For active members that become duty disabled, the Component II (Legacy) plan is assumed to only be responsible for the frozen benefit which becomes payable starting at age 65.
Duty Death Benefit:	For current active members, the duty death pension benefit is assumed to be payable entirely by the Component I (Hybrid) plan. It was assumed that the Component II (Legacy) plan would only be responsible for the refund of member contributions.
Mandatory Retirement Age:	Currently most members of the DPFERS are subject to a mandatory retirement age of 60. However, we understand that the mandatory retirement age is currently not enforced for Police members. Recent membership data indicates that very few Police members stay in employment past age 65. We have, therefore, assumed employment would end at age 65 for Police members and age 60 for Fire members regardless of the length of their DROP participation at that age.
DROP Assumption:	All active members not in the DROP are assumed to have a 40% chance of retiring or entering the DROP in their first five years of retirement eligibility (see page 26). For DPLSA members, 65% of eligible members are assumed to enter the DROP and remain in the DROP for seven years. For all other active members 60% of eligible members are assumed to enter the DROP and remain in the DROP for five years.
Workers Comp Offset:	No Workers Compensation offsets are assumed for duty disability benefits.
DROP Account:	DROP account balances are not reported. No liability is included for DROP account balances.
Class Codes:	For valuation purposes, members are categorized as DPOA, DFFA or LSA based on class codes provided by the Retirement System and are primarily used in the valuation to determine normal retirement eligibility (20 & Out versus 25 & Out). The class codes used for this valuation were taken from the 2014 data file. Therefore, counts in the valuation may not represent actual membership in the respective associations.
Frozen Benefit Estimate:	Reported AFC was adjusted to include 25% of unused sick leave (to a maximum of 25 days per year of service).

Miscellaneous and Technical Assumptions (Concluded)

Form of Payment:	The actuarial equivalent basis for optional forms of payment and early retirement are based on the RP-2014 Mortality Table with Blue Collar adjustments projected 11 years, a 6.75% interest rate, 90%/10% unisex mix and a 1.0125% COLA assumption per System Policy. Annuity withdrawal factors use the same mortality and interest rate assumptions with a 0% COLA assumption. No adjustment has been made for alternate forms of payment elections. Principal balances of accumulated member contributions were converted to life annuity offsets based on plan factors for the valuation.
Retiree Pop-Up Factor:	If a retiree has a pop-up option but no pop-up factor is provided in the data, the pop-up factor is determined by using an average age at retirement of 50.2, beneficiary age of 47.2, and the optional form of payment assumptions (determined above).
Member Contributions:	Member contributions to this Component II plan are assumed to have ceased with the bankruptcy. However, for purposes of determining refunds on member contributions, contribution balances are assumed to earn 5.25% interest.
Limit Testing:	We understand the System has specific outside counsel regarding I.R.C. section 415 testing. We have not adjusted liabilities for potential 415 limits.

The rationale for the miscellaneous and technical assumptions is the 2002-2007 Experience Study, modified as necessary for changes in data or administration.

SECTION G

CALCULATION OF THE SINGLE DISCOUNT RATE

Calculation of the Single Discount Rate at End of Year

GASB Statement No. 67 includes a specific requirement for the discount rate that is used for the purpose of the measurement of the Total Pension Liability. This rate considers the ability of the fund to meet benefit obligations in the future. To make this determination, employer contributions, employee contributions, benefit payments, expenses and investment returns are projected into the future. The Plan Net Position (assets) in future years can then be determined and compared to its obligation to make benefit payments in those years. As long as assets are projected to be on hand in a future year, the assumed valuation discount rate is used. In years where assets are not projected to be sufficient to meet benefit payments, the use of a municipal bond rate is required, as described in the following paragraph.

The Single Discount Rate (SDR) is equivalent to applying these two rates to the benefits that are projected to be paid during the different time periods. The SDR reflects (1) the long-term expected rate of return on pension plan investments (during the period in which the fiduciary net position is projected to be sufficient to pay benefits) and (2) tax-exempt municipal bond rate based on an index of 20-year general obligation bonds with an average AA credit rating as of the measurement date (to the extent that the contributions for use with the long-term expected rate of return are not met).

For the purpose of this valuation, the expected rate of return on pension plan investments is 7.19%; the municipal bond rate is 3.13%; and the resulting SDR is 7.19% as of June 30, 2019.

The tables in this section provide background for the development of the SDR.

The **Projection of Contributions** table shows the development of expected contributions in future years. Normal Cost contributions for future hires are not included (nor are their liabilities). For purposes of determining the discount rate as of June 30, 2019, the employer contributions for the 10-year period ending June 30, 2023 were set by the 8th Amended Plan of Adjustment (POA). Subsequent employer contributions were determined by a closed 30-year level dollar amortization of any unfunded actuarial accrued liability (excluding the contingency reserve) using 7.19% interest, net of all expenses, consistent with the 100% funded target by 2053 in the POA and State Law.

Note that these projections are specifically used to determine the GASB discount rate and should not be interpreted as a funding projection or recommendation.

Rates of Return: The 7.19% rate of return was before administrative expenses. Therefore, the projections assumed that any administration expenses incurred by the plan will directly increase employer contributions beginning with FY 2024.

Contingency Reserve: The System maintains a contingency reserve equal to the excess (if any) of the Annuity Reserve Fund over the annuity liabilities. We believe GASB 67/68 requires this reserve to be removed from the NPL. Since there are no benefits in the projection directly related to the reserve, the result is that the reserve will continue to grow with interest, if experience is exactly as assumed. Please see comments on page 7 for additional details.

Calculation of the Single Discount Rate at End of Year

Administrative Expenses: For purposes of the projection using a 7.19% rate of return, administrative expenses were assumed to be related to Component I payroll. Payroll was increased by assumed wage inflation as of June 30, 2014 of 2.00% for 5 years, 2.50% for the next 5 years and 3.00% thereafter. Since benefits are frozen, the wage inflation assumption does not affect anything other than the administrative expenses.

The **Projection of Plan Fiduciary Net Position** table shows the development of expected asset levels in future years.

The **Present Values of Projected Benefit Payments** table shows the development of the SDR. It breaks down the benefit payments into present values for funded and unfunded portions and shows the equivalent total at the SDR. For purposes of determining the discount rate as of June 30, 2019, the benefit payments reflect the plan provisions in force as of June 30, 2019.

Unfunded Actuarial Accrued Liabilities: Actual employer contributions through June 30, 2023 are set by the POA. The amortization period and method after 2023 has not yet been established by the Board.

Single Discount Rate Development Projection of Contributions End of Year

Fiscal Year Ending June 30,	Projected Contributions from Current Employees	Projected Service Cost	Administrative Expense Contributions#	Projected UAL Contributions	Projected Total Contributions
2020	\$ -	\$ -	\$ 2,216,014	\$ 16,083,986	\$ 18,300,000
2021	-	-	2,074,470	16,225,530	18,300,000
2022	-	-	1,971,666	16,328,334	18,300,000
2023	-	-	1,896,166	16,403,834	18,300,000
2024	-	-	1,840,810	101,362,300	103,203,110
2025	-	-	1,786,510	101,362,300	103,148,810
2026	-	-	1,726,269	101,362,300	103,088,569
2027	-	-	1,665,623	101,362,300	103,027,923
2028	-	-	1,598,780	101,362,300	102,961,080
2029	-	-	1,528,208	101,362,300	102,890,508
2030	-	-	1,458,825	101,362,300	102,821,125
2031	-	-	1,395,418	101,362,300	102,757,718
2032	-	-	1,332,810	101,362,300	102,695,110
2033	-	-	1,264,594	101,362,300	102,626,894
2034	-	-	1,195,601	101,362,300	102,557,901
2035	-	-	1,130,992	101,362,300	102,493,292
2036	-	-	1,071,827	101,362,300	102,434,127
2037	-	-	1,022,435	101,362,300	102,384,735
2038	-	-	977,625	101,362,300	102,339,925
2039	-	-	936,164	101,362,300	102,298,464
2040	-	-	890,158	101,362,300	102,252,458
2041	-	-	831,739	101,362,300	102,194,039
2042	-	-	762,205	101,362,300	102,124,505
2043	-	-	663,196	101,362,300	102,025,496
2044	-	-	548,286	101,362,300	101,910,586
2045	-	-	448,332	101,362,300	101,810,632
2046	-	-	357,260	101,362,300	101,719,560
2047	-	-	276,648	101,362,300	101,638,948
2048	-	-	209,110	101,362,300	101,571,410
2049	-	-	153,678	101,362,300	101,515,978
2050	-	-	109,133	101,362,300	101,471,433
2051	-	-	75,998	101,362,300	101,438,298
2052	-	-	52,650	101,362,300	101,414,950
2053	-	-	35,327	101,362,300	101,397,627
2054	-	-	22,794	-	22,794
2055	-	-	14,112	-	14,112
2056	-	-	8,006	-	8,006
2057	-	-	4,059	-	4,059
2058	-	-	1,673	-	1,673
2059	-	-	508	-	508
2060	-	-	41	-	41
2061	-	-	-	-	-
2062	-	-	-	-	-
2063	-	-	-	-	-
2064	-	-	-	-	-
2065	-	-	-	-	-
2066	-	-	-	-	-
2067	-	-	-	-	-
2068	-	-	-	-	-
2069	-	-	-	-	-

Expenses assumed to be part of total employer contribution.

Employer contributions as shown may differ substantially from those determined by a funding valuation.

Single Discount Rate Development Projection of Contributions End of Year (Concluded)

Fiscal Year Ending June 30,	Projected Contributions from Current Employees	Projected Service Cost	Administrative Expense Contributions#	Projected UAL Contributions	Projected Total Contributions
2070	\$ -	\$ -	\$ -	\$ -	\$ -
2071	-	-	-	-	-
2072	-	-	-	-	-
2073	-	-	-	-	-
2074	-	-	-	-	-
2075	-	-	-	-	-
2076	-	-	-	-	-
2077	-	-	-	-	-
2078	-	-	-	-	-
2079	-	-	-	-	-
2080	-	-	-	-	-
2081	-	-	-	-	-
2082	-	-	-	-	-
2083	-	-	-	-	-
2084	-	-	-	-	-
2085	-	-	-	-	-
2086	-	-	-	-	-
2087	-	-	-	-	-
2088	-	-	-	-	-
2089	-	-	-	-	-
2090	-	-	-	-	-
2091	-	-	-	-	-
2092	-	-	-	-	-
2093	-	-	-	-	-
2094	-	-	-	-	-
2095	-	-	-	-	-
2096	-	-	-	-	-
2097	-	-	-	-	-
2098	-	-	-	-	-
2099	-	-	-	-	-
2100	-	-	-	-	-
2101	-	-	-	-	-
2102	-	-	-	-	-
2103	-	-	-	-	-
2104	-	-	-	-	-
2105	-	-	-	-	-
2106	-	-	-	-	-
2107	-	-	-	-	-
2108	-	-	-	-	-
2109	-	-	-	-	-
2110	-	-	-	-	-
2111	-	-	-	-	-
2112	-	-	-	-	-
2113	-	-	-	-	-
2114	-	-	-	-	-
2115	-	-	-	-	-
2116	-	-	-	-	-
2117	-	-	-	-	-
2118	-	-	-	-	-
2119	-	-	-	-	-

Expenses assumed to be part of total employer contribution.

Employer contributions as shown may differ substantially from those determined by a funding valuation.

Single Discount Rate Development Projection of Plan Fiduciary Net Position End of Year

Fiscal Year Ending June 30,	Projected Beginning Plan Net Position Without Annuity Reserve	Projected Total Contributions	Projected Benefit Payments	Annuity Reserve Refund	Projected Administrative Expenses	Projected Investment Earnings at 7.19%	Projected Ending Plan Net Position Without Annuity Reserve	Projected Ending Plan Net Position With Annuity Reserve
	(a)	(b)	(c)	(d)	(e)	(f)	(g)=(a)+(b)-(c)-(d)-(e)+(f)	(h)
2020	\$ 2,670,843,356	\$ 18,300,000	\$ 318,144,641	\$ 25,757,789	\$ 2,216,014	\$ 179,511,047	\$ 2,522,535,958	\$ 2,550,145,733
2021	2,522,535,958	18,300,000	316,890,470	-	2,074,470	170,749,035	2,392,620,053	2,422,214,970
2022	2,392,620,053	18,300,000	315,303,083	-	1,971,666	161,467,789	2,255,113,093	2,286,835,884
2023	2,255,113,093	18,300,000	313,462,192	-	1,896,166	151,648,737	2,109,703,472	2,143,707,132
2024	2,109,703,472	103,203,110	311,145,773	-	1,840,810	144,276,861	2,044,196,860	2,080,645,383
2025	2,044,196,860	103,148,810	308,612,290	-	1,786,510	139,656,434	1,976,603,303	2,015,672,475
2026	1,976,603,303	103,088,569	305,540,372	-	1,726,269	134,904,976	1,907,330,206	1,949,208,452
2027	1,907,330,206	103,027,923	302,487,643	-	1,665,623	130,032,081	1,836,236,944	1,881,126,236
2028	1,836,236,944	102,961,080	299,252,753	-	1,598,780	125,034,751	1,763,381,242	1,811,498,074
2029	1,763,381,242	102,890,508	295,448,117	-	1,528,208	119,930,829	1,689,226,254	1,740,802,686
2030	1,689,226,254	102,821,125	291,228,567	-	1,458,825	114,748,145	1,614,108,132	1,669,392,909
2031	1,614,108,132	102,757,718	286,636,930	-	1,395,418	109,509,356	1,538,342,858	1,597,602,611
2032	1,538,342,858	102,695,110	281,598,939	-	1,332,810	104,239,806	1,462,346,024	1,525,866,553
2033	1,462,346,024	102,626,894	276,200,919	-	1,264,594	98,966,324	1,386,473,729	1,454,561,384
2034	1,386,473,729	102,557,901	270,347,181	-	1,195,601	93,717,895	1,311,206,742	1,384,189,900
2035	1,311,206,742	102,493,292	264,132,482	-	1,130,992	88,525,740	1,236,962,300	1,315,192,946
2036	1,236,962,300	102,434,127	257,477,038	-	1,071,827	83,422,675	1,164,270,236	1,248,125,666
2037	1,164,270,236	102,384,735	250,339,479	-	1,022,435	78,448,257	1,093,741,314	1,183,625,949
2038	1,093,741,314	102,339,925	242,717,686	-	977,625	73,646,475	1,026,032,402	1,122,379,743
2039	1,026,032,402	102,298,464	234,830,601	-	936,164	69,056,824	961,620,924	1,064,895,639
2040	961,620,924	102,252,458	226,647,207	-	890,158	64,714,725	901,050,742	1,011,750,909
2041	901,050,742	102,194,039	218,109,283	-	831,739	60,661,340	844,965,099	963,624,608
2042	844,965,099	102,124,505	209,329,349	-	762,205	56,938,943	793,936,992	921,128,119
2043	793,936,992	102,025,496	200,282,195	-	663,196	53,589,622	748,606,719	884,942,888
2044	748,606,719	101,910,586	191,123,558	-	548,286	50,653,914	709,499,374	855,638,114
2045	709,499,374	101,810,632	181,892,280	-	448,332	48,168,200	677,137,593	833,783,709
2046	677,137,593	101,719,560	172,671,362	-	357,260	46,167,126	651,995,658	819,904,629
2047	651,995,658	101,638,948	163,549,493	-	276,648	44,681,661	634,490,126	814,471,752
2048	634,490,126	101,571,410	154,539,744	-	209,110	43,741,292	625,053,973	817,976,278
2049	625,053,973	101,515,978	145,719,970	-	153,678	43,374,400	624,070,703	830,864,122
2050	624,070,703	101,471,433	137,141,866	-	109,133	43,606,733	631,897,869	853,559,735
2051	631,897,869	101,438,298	128,836,045	-	75,998	44,462,918	648,887,042	886,486,396
2052	648,887,042	101,414,950	120,816,213	-	52,650	45,967,749	675,400,877	930,083,625
2053	675,400,877	101,397,627	113,093,230	-	35,327	48,146,916	711,816,862	984,811,299
2054	711,816,862	22,794	105,672,398	-	22,794	47,446,645	653,591,110	946,213,847
2055	653,591,110	14,112	98,555,238	-	14,112	43,511,635	598,547,506	912,209,818
2056	598,547,506	8,006	91,737,459	-	8,006	39,794,845	546,604,892	882,819,524
2057	546,604,892	4,059	85,212,059	-	4,059	36,290,688	497,683,521	858,071,985
2058	497,683,521	1,673	78,969,268	-	1,673	32,993,774	451,708,027	838,008,422
2059	451,708,027	508	72,999,657	-	508	29,899,019	408,607,389	822,682,782
2060	408,607,389	41	67,294,937	-	41	27,001,608	368,314,060	812,161,474
2061	368,314,060	-	61,847,687	-	-	24,296,947	330,763,320	806,523,363
2062	330,763,320	-	56,652,258	-	-	21,780,583	295,891,645	805,858,835
2063	295,891,645	-	51,705,366	-	-	19,448,064	263,634,343	810,268,174
2064	263,634,343	-	47,006,291	-	-	17,294,763	233,922,815	819,859,618
2065	233,922,815	-	42,556,569	-	-	15,315,696	206,681,942	834,747,601
2066	206,681,942	-	38,358,768	-	-	13,505,368	181,828,543	855,052,123
2067	181,828,543	-	34,415,179	-	-	11,857,720	159,271,084	880,899,439
2068	159,271,084	-	30,727,670	-	-	10,366,104	138,909,518	912,422,952
2069	138,909,518	-	27,297,716	-	-	9,023,274	120,635,076	949,764,126

Employer contributions as shown may differ substantially from those determined by a funding valuation.

Single Discount Rate Development Projection of Plan Fiduciary Net Position End of Year (Concluded)

Fiscal Year Ending June 30,	Projected Beginning Plan Net Position Without Annuity Reserve	Projected Total Contributions	Projected Benefit Payments	Annuity Reserve Refund	Projected Administrative Expenses	Projected Investment Earnings at 7.19%	Projected Ending Plan Net Position Without Annuity Reserve	Projected Ending Plan Net Position With Annuity Reserve
	(a)	(b)	(c)	(d)	(e)	(f)	(g)=(a)+(b)-(c)-(e)+(f)	(h)
2070	\$ 120,635,076	\$ -	\$ 24,125,821	\$ -	\$ -	\$ 7,821,392	\$ 104,330,647	\$ 993,074,076
2071	104,330,647	-	21,210,901	-	-	6,752,076	89,871,823	1,042,515,904
2072	89,871,823	-	18,549,796	-	-	5,806,493	77,128,520	1,098,267,711
2073	77,128,520	-	16,137,082	-	-	4,975,481	65,966,920	1,160,526,019
2074	65,966,920	-	13,965,273	-	-	4,249,684	56,251,331	1,229,509,229
2075	56,251,331	-	12,024,861	-	-	3,619,680	47,846,150	1,305,461,291
2076	47,846,150	-	10,304,321	-	-	3,076,127	40,617,957	1,388,655,626
2077	40,617,957	-	8,790,339	-	-	2,609,903	34,437,521	1,479,399,099
2078	34,437,521	-	7,468,360	-	-	2,212,230	29,181,391	1,578,035,706
2079	29,181,391	-	6,323,024	-	-	1,874,775	24,733,142	1,684,950,083
2080	24,733,142	-	5,338,544	-	-	1,589,723	20,984,321	1,800,570,860
2081	20,984,321	-	4,498,976	-	-	1,349,842	17,835,187	1,925,373,998
2082	17,835,187	-	3,788,379	-	-	1,148,522	15,195,330	2,059,886,181
2083	15,195,330	-	3,191,201	-	-	979,812	12,983,941	2,204,688,065
2084	12,983,941	-	2,692,629	-	-	838,425	11,129,737	2,360,417,387
2085	11,129,737	-	2,278,675	-	-	719,732	9,570,794	2,527,772,226
2086	9,570,794	-	1,936,215	-	-	619,741	8,254,320	2,707,514,435
2087	8,254,320	-	1,653,282	-	-	535,082	7,136,119	2,900,473,036
2088	7,136,119	-	1,419,223	-	-	462,951	6,179,848	3,107,547,689
2089	6,179,848	-	1,224,783	-	-	401,064	5,356,129	3,329,712,319
2090	5,356,129	-	1,062,079	-	-	347,587	4,641,637	3,568,019,036
2091	4,641,637	-	924,588	-	-	301,072	4,018,120	3,823,602,354
2092	4,018,120	-	807,081	-	-	260,392	3,471,431	4,097,683,772
2093	3,471,431	-	705,468	-	-	224,675	2,990,638	4,391,576,846
2094	2,990,638	-	616,664	-	-	193,243	2,567,216	4,706,692,773
2095	2,567,216	-	538,415	-	-	165,563	2,194,364	5,044,546,548
2096	2,194,364	-	469,078	-	-	141,204	1,866,490	5,406,763,796
2097	1,866,490	-	407,435	-	-	119,808	1,578,863	5,795,088,285
2098	1,578,863	-	352,534	-	-	101,067	1,327,395	6,211,390,145
2099	1,327,395	-	303,671	-	-	84,712	1,108,436	6,657,674,698
2100	1,108,436	-	260,237	-	-	70,503	918,703	7,136,092,078
2101	918,703	-	221,695	-	-	58,223	755,231	7,648,947,572
2102	755,231	-	187,569	-	-	47,675	615,337	8,198,712,708
2103	615,337	-	157,439	-	-	38,681	496,580	8,788,037,151
2104	496,580	-	130,978	-	-	31,077	396,679	9,419,761,418
2105	396,679	-	107,898	-	-	24,710	313,491	10,096,930,554
2106	313,491	-	87,925	-	-	19,434	245,000	10,822,808,830
2107	245,000	-	70,805	-	-	15,114	189,309	11,600,895,479
2108	189,309	-	56,316	-	-	11,622	144,615	12,434,941,558
2109	144,615	-	44,240	-	-	8,835	109,209	13,328,968,053
2110	109,209	-	34,333	-	-	6,639	81,515	14,287,285,310
2111	81,515	-	26,347	-	-	4,930	60,098	15,314,513,845
2112	60,098	-	20,038	-	-	3,613	43,673	16,415,606,645
2113	43,673	-	15,152	-	-	2,605	31,126	17,595,873,076
2114	31,126	-	11,434	-	-	1,834	21,527	18,861,004,512
2115	21,527	-	8,641	-	-	1,243	14,128	20,217,101,791
2116	14,128	-	6,563	-	-	784	8,349	21,670,704,614
2117	8,349	-	5,024	-	-	423	3,747	23,228,823,074
2118	3,747	-	3,880	-	-	132	-	24,898,971,436
2119	-	-	-	-	-	-	-	26,689,207,482

Employer contributions as shown may differ substantially from those determined by a funding valuation.

Single Discount Rate Development

Present Values of Projected Benefits

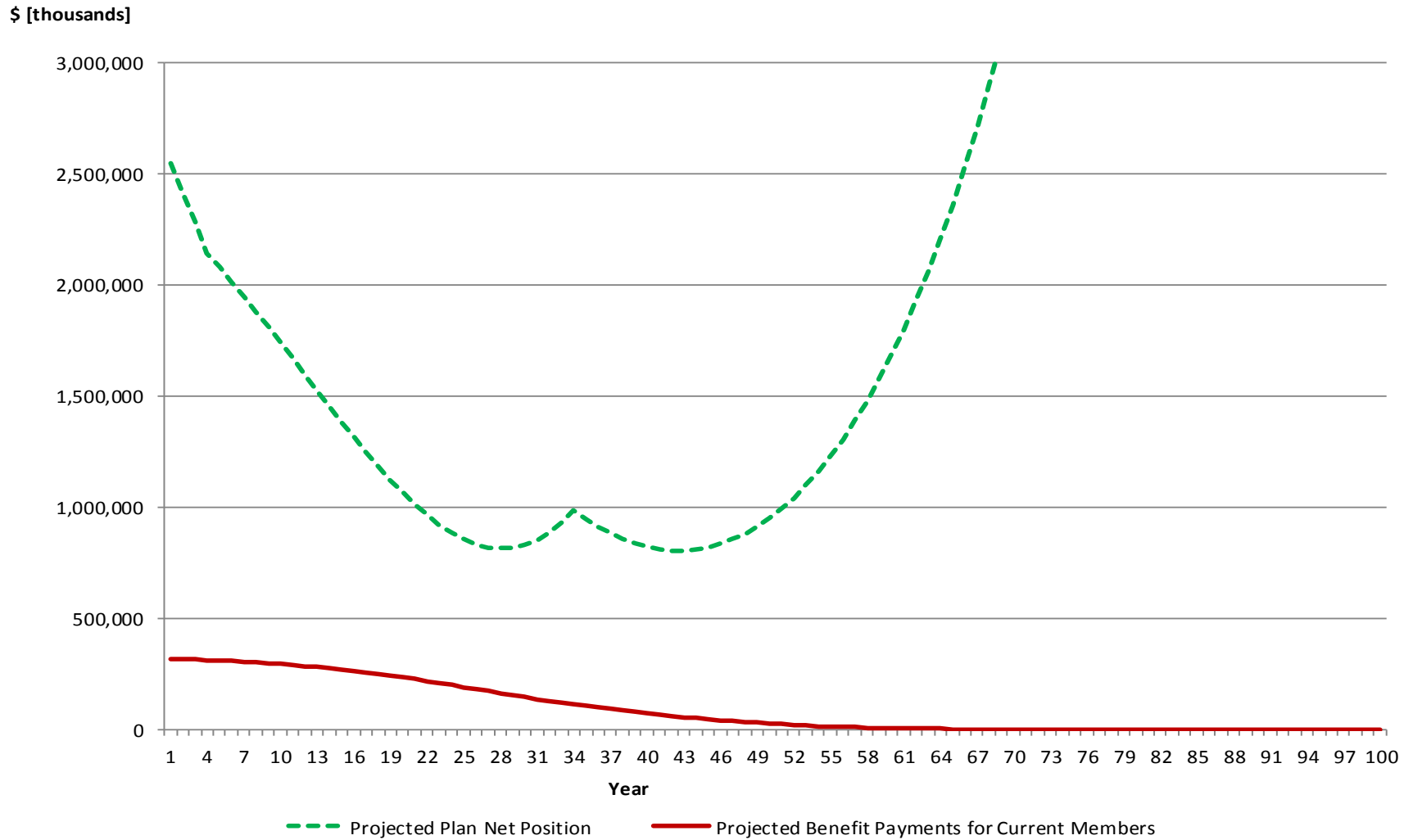
End of Year

Fiscal Year	Projected Beginning Plan Net Position With Annuity Reserve	Projected Benefit Payments	Funded Portion of Benefit Payments	Unfunded Portion of Benefit Payments	Present Value of Funded Benefit Payments using Expected Return Rate (v)	Present Value of Unfunded Benefit Payments using Municipal Bond Rate (vf)	Present Value of Benefit Payments using Single Discount Rate (sdr)
Ending June 30,	(b)	(c)	(d)	(e)	(f)=(d)*v^(a)-.5)	(g)=(e)*vf^(a)-.5)	(h)=(c)/(1+sdr)^(a-.5)
(a)	(b)	(c)	(d)	(e)	(f)=(d)*v^(a)-.5)	(g)=(e)*vf^(a)-.5)	(h)=(c)/(1+sdr)^(a-.5)
2020	\$ 2,670,843,356	\$ 318,144,641	\$ 318,144,641	\$ -	\$ 307,289,328	\$ -	\$ 307,289,328
2021	2,550,145,733	316,890,470	316,890,470	-	285,547,113	-	285,547,113
2022	2,422,214,970	315,303,083	315,303,083	-	265,058,991	-	265,058,991
2023	2,286,835,884	313,462,192	313,462,192	-	245,835,851	-	245,835,851
2024	2,143,707,132	311,145,773	311,145,773	-	227,651,065	-	227,651,065
2025	2,080,645,383	308,612,290	308,612,290	-	210,651,583	-	210,651,583
2026	2,015,672,475	305,540,372	305,540,372	-	194,565,503	-	194,565,503
2027	1,949,208,452	302,487,643	302,487,643	-	179,701,046	-	179,701,046
2028	1,881,126,236	299,252,753	299,252,753	-	165,854,344	-	165,854,344
2029	1,811,498,074	295,448,117	295,448,117	-	152,762,112	-	152,762,112
2030	1,740,802,686	291,228,567	291,228,567	-	140,479,880	-	140,479,880
2031	1,669,392,909	286,636,930	286,636,930	-	128,990,590	-	128,990,590
2032	1,597,602,611	281,598,939	281,598,939	-	118,223,178	-	118,223,178
2033	1,525,866,553	276,200,919	276,200,919	-	108,178,875	-	108,178,875
2034	1,454,561,384	270,347,181	270,347,181	-	98,783,616	-	98,783,616
2035	1,384,189,900	264,132,482	264,132,482	-	90,038,990	-	90,038,990
2036	1,315,192,946	257,477,038	257,477,038	-	81,882,866	-	81,882,866
2037	1,248,125,666	250,339,479	250,339,479	-	74,272,767	-	74,272,767
2038	1,183,625,949	242,717,686	242,717,686	-	67,181,147	-	67,181,147
2039	1,122,379,743	234,830,601	234,830,601	-	60,638,215	-	60,638,215
2040	1,064,895,639	226,647,207	226,647,207	-	54,599,393	-	54,599,393
2041	1,011,750,909	218,109,283	218,109,283	-	49,018,196	-	49,018,196
2042	963,624,608	209,329,349	209,329,349	-	43,889,338	-	43,889,338
2043	921,128,119	200,282,195	200,282,195	-	39,175,719	-	39,175,719
2044	884,942,888	191,123,558	191,123,558	-	34,876,636	-	34,876,636
2045	855,638,114	181,892,280	181,892,280	-	30,965,661	-	30,965,661
2046	833,783,709	172,671,362	172,671,362	-	27,424,084	-	27,424,084
2047	819,904,629	163,549,493	163,549,493	-	24,232,976	-	24,232,976
2048	814,471,752	154,539,744	154,539,744	-	21,362,077	-	21,362,077
2049	817,976,278	145,719,970	145,719,970	-	18,791,787	-	18,791,787
2050	830,864,122	137,141,866	137,141,866	-	16,499,272	-	16,499,272
2051	853,559,735	128,836,045	128,836,045	-	14,460,318	-	14,460,318
2052	886,486,396	120,816,213	120,816,213	-	12,650,608	-	12,650,608
2053	930,083,625	113,093,230	113,093,230	-	11,047,615	-	11,047,615
2054	984,811,299	105,672,398	105,672,398	-	9,630,287	-	9,630,287
2055	946,213,847	98,555,238	98,555,238	-	8,379,210	-	8,379,210
2056	912,209,818	91,737,459	91,737,459	-	7,276,387	-	7,276,387
2057	882,819,524	85,212,059	85,212,059	-	6,305,447	-	6,305,447
2058	858,071,985	78,969,268	78,969,268	-	5,451,533	-	5,451,533
2059	838,008,422	72,999,657	72,999,657	-	4,701,399	-	4,701,399
2060	822,682,782	67,294,937	67,294,937	-	4,043,286	-	4,043,286
2061	812,161,474	61,847,687	61,847,687	-	3,466,740	-	3,466,740
2062	806,523,363	56,652,258	56,652,258	-	2,962,516	-	2,962,516
2063	805,858,835	51,705,366	51,705,366	-	2,522,463	-	2,522,463
2064	810,268,174	47,006,291	47,006,291	-	2,139,395	-	2,139,395
2065	819,859,618	42,556,569	42,556,569	-	1,806,955	-	1,806,955
2066	834,747,601	38,358,768	38,358,768	-	1,519,466	-	1,519,466
2067	855,052,123	34,415,179	34,415,179	-	1,271,810	-	1,271,810
2068	880,899,439	30,727,670	30,727,670	-	1,059,370	-	1,059,370
2069	912,422,952	27,297,716	27,297,716	-	877,991	-	877,991

Single Discount Rate Development Present Values of Projected Benefits at End of Year (Concluded)

Fiscal Year Ending June 30,	Projected Beginning Plan Net Position With Annuity Reserve	Projected Benefit Payments	Funded Portion of Benefit Payments	Unfunded Portion of Benefit Payments	Present Value of Funded Benefit Payments using Expected Return Rate (v)	Present Value of Unfunded Benefit Payments using Municipal Bond Rate (vf)	Present Value of Benefit Payments using Single Discount Rate (sdr)
(a)	(b)	(c)	(d)	(e)	(f)=(d)*v ^a ((a)-.5)	(g)=(e)*vf ^a ((a)-.5)	(h)=(c)/(1+sdr) ^a ((a)-.5)
2070	\$ 949,764,126	\$ 24,125,821	\$ 24,125,821	\$ -	\$ 723,921	\$ -	\$ 723,921
2071	993,074,076	21,210,901	21,210,901	-	593,764	-	593,764
2072	1,042,515,904	18,549,796	18,549,796	-	484,440	-	484,440
2073	1,098,267,711	16,137,082	16,137,082	-	393,162	-	393,162
2074	1,160,526,019	13,965,273	13,965,273	-	317,425	-	317,425
2075	1,229,509,229	12,024,861	12,024,861	-	254,987	-	254,987
2076	1,305,461,291	10,304,321	10,304,321	-	203,846	-	203,846
2077	1,388,655,626	8,790,339	8,790,339	-	162,231	-	162,231
2078	1,479,399,099	7,468,360	7,468,360	-	128,588	-	128,588
2079	1,578,035,706	6,323,024	6,323,024	-	101,565	-	101,565
2080	1,684,950,083	5,338,544	5,338,544	-	80,000	-	80,000
2081	1,800,570,860	4,498,976	4,498,976	-	62,896	-	62,896
2082	1,925,373,998	3,788,379	3,788,379	-	49,410	-	49,410
2083	2,059,886,181	3,191,201	3,191,201	-	38,829	-	38,829
2084	2,204,688,065	2,692,629	2,692,629	-	30,565	-	30,565
2085	2,360,417,387	2,278,675	2,278,675	-	24,131	-	24,131
2086	2,527,772,226	1,936,215	1,936,215	-	19,129	-	19,129
2087	2,707,514,435	1,653,282	1,653,282	-	15,238	-	15,238
2088	2,900,473,036	1,419,223	1,419,223	-	12,203	-	12,203
2089	3,107,547,689	1,224,783	1,224,783	-	9,825	-	9,825
2090	3,329,712,319	1,062,079	1,062,079	-	7,948	-	7,948
2091	3,568,019,036	924,588	924,588	-	6,455	-	6,455
2092	3,823,602,354	807,081	807,081	-	5,257	-	5,257
2093	4,097,683,772	705,468	705,468	-	4,287	-	4,287
2094	4,391,576,846	616,664	616,664	-	3,496	-	3,496
2095	4,706,692,773	538,415	538,415	-	2,848	-	2,848
2096	5,044,546,548	469,078	469,078	-	2,314	-	2,314
2097	5,406,763,796	407,435	407,435	-	1,875	-	1,875
2098	5,795,088,285	352,534	352,534	-	1,514	-	1,514
2099	6,211,390,145	303,671	303,671	-	1,217	-	1,217
2100	6,657,674,698	260,237	260,237	-	973	-	973
2101	7,136,092,078	221,695	221,695	-	773	-	773
2102	7,648,947,572	187,569	187,569	-	610	-	610
2103	8,198,712,708	157,439	157,439	-	478	-	478
2104	8,788,037,151	130,978	130,978	-	371	-	371
2105	9,419,761,418	107,898	107,898	-	285	-	285
2106	10,096,930,554	87,925	87,925	-	217	-	217
2107	10,822,808,830	70,805	70,805	-	163	-	163
2108	11,600,895,479	56,316	56,316	-	121	-	121
2109	12,434,941,558	44,240	44,240	-	89	-	89
2110	13,328,968,053	34,333	34,333	-	64	-	64
2111	14,287,285,310	26,347	26,347	-	46	-	46
2112	15,314,513,845	20,038	20,038	-	33	-	33
2113	16,415,606,645	15,152	15,152	-	23	-	23
2114	17,595,873,076	11,434	11,434	-	16	-	16
2115	18,861,004,512	8,641	8,641	-	11	-	11
2116	20,217,101,791	6,563	6,563	-	8	-	8
2117	21,670,704,614	5,024	5,024	-	6	-	6
2118	23,228,823,074	3,880	3,880	-	4	-	4
2119	24,898,971,436	-	-	-	-	-	-
Totals					\$ 3,669,742,652	\$ -	\$ 3,669,742,652

Projection of Plan Net Position With Annuity Reserve and Benefit Payments End of Year



SECTION H

GLOSSARY OF TERMS

Glossary of Terms

<i>Actuarial Accrued Liability (AAL)</i>	The AAL is the difference between the actuarial present value of all benefits and the actuarial value of future normal costs. The definition comes from the fundamental equation of funding which states that the present value of all benefits is the sum of the Actuarial Accrued Liability and the present value of future normal costs. The AAL may also be referred to as “accrued liability” or “actuarial liability.”
<i>Actuarial Assumptions</i>	These assumptions are estimates of future experience with respect to rates of mortality, disability, turnover, retirement, rate or rates of investment income and compensation increases. Actuarial assumptions are generally based on past experience, often modified for projected changes in conditions. Economic assumptions (compensation increases, payroll growth, inflation and investment return) consist of an underlying real rate of return plus an assumption for a long-term average rate of inflation.
<i>Accrued Service</i>	Service credited under the system which was rendered before the date of the actuarial valuation.
<i>Actuarial Equivalent</i>	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.
<i>Actuarial Cost Method</i>	A mathematical budgeting procedure for allocating the dollar amount of the actuarial present value of the pension trust benefits between future normal cost and actuarial accrued liability. The actuarial cost method may also be referred to as the actuarial funding method.
<i>Actuarial Gain (Loss)</i>	The difference in liabilities between actual experience and expected experience during the period between two actuarial valuations is the gain (loss) on the accrued liabilities.
<i>Actuarial Present Value (APV)</i>	The amount of funds currently required to provide a payment or series of payments in the future. The present value is determined by discounting future payments at predetermined rates of interest and probabilities of payment.
<i>Actuarial Valuation</i>	The actuarial valuation report determines, as of the actuarial valuation date, the service cost, total pension liability, and related actuarial present value of projected benefit payments for pensions.
<i>Actuarial Valuation Date</i>	The date as of which an actuarial valuation is performed.
<i>Actuarially Determined Contribution (ADC) or Annual Required Contribution (ARC)</i>	A calculated contribution into a defined benefit pension plan for the reporting period, most often determined based on the funding policy of the plan. Typically the Actuarially Determined Contribution has a normal cost payment and an amortization payment.
<i>AFC</i>	Average Final Compensation.

Glossary of Terms

<i>Amortization Payment</i>	The amortization payment is the periodic payment required to pay off an interest-discounted amount with payments of interest and principal.
<i>Amortization Method</i>	The method used to determine the periodic amortization payment may be a level dollar amount, or a level percent of pay amount. The period will typically be expressed in years, and the method will either be “open” (meaning, reset each year) or “closed” (the number of years remaining will decline each year).
<i>Cost-of-Living Adjustments</i>	Postemployment benefit changes intended to adjust benefit payments for the effects of inflation.
<i>Cost-Sharing Multiple-Employer Defined Benefit Pension Plan (cost-sharing pension plan)</i>	A multiple-employer defined benefit pension plan in which the pension obligations to the employees of more than one employer are pooled and pension plan assets can be used to pay the benefits of the employees of any employer that provides pensions through the pension plan.
<i>Covered-Employee Payroll</i>	The payroll of covered employees, which is typically only the pensionable pay and does not include pay above any pay cap.
<i>Deferred Retirement Option Program (DROP)</i>	A program that permits a plan member to elect a calculation of benefit payments based on service credits and salary, as applicable, as of the DROP entry date. The plan member continues to provide service to the employer and is paid for the service by the employer after the DROP entry date; however, the pensions that would have been paid to the plan member are credited to an individual member account within the defined benefit pension plan until the end of the DROP period. Other variations for DROP exist and will be more fully detailed in the plan provision section of the valuation report.
<i>Deferred Inflows and Outflows</i>	The deferred inflows and outflows of pension resources are amounts used under GASB Statement No. 68 in developing the annual pension expense. Deferred inflows and outflows arise with differences between expected and actual experiences; changes of assumptions. The portion of these amounts not included in pension expense should be included in the deferred inflows or outflows of resources.
<i>Discount Rate</i>	For GASB purposes, the discount rate is the single rate of return that results in the present value of all projected benefit payments to be equal to the sum of the funded and unfunded projected benefit payments, specifically: <ol style="list-style-type: none">1. The benefit payments to be made while the pension plans’ fiduciary net position is projected to be greater than the benefit payments that are projected to be made in the period; and2. The present value of the benefit payments not in (1) above, discounted using the municipal bond rate.

Glossary of Terms

Entry Age Actuarial Cost Method (EAN)

The EAN is a funding method for allocating the costs of the plan between the normal cost and the accrued liability. The actuarial present value of the projected benefits of each individual included in an actuarial valuation is allocated on a level basis (either level dollar or level percent of pay) over the earnings or service of the individual between entry age and assumed exit age(s). The portion of the actuarial present value allocated to a valuation year is the normal cost. The portion of this actuarial present value not provided for at a valuation date by the actuarial present value of future normal costs is the actuarial accrued liability. The sum of the accrued liability plus the present value of all future normal costs is the present value of all benefits.

GASB

The Governmental Accounting Standards Board is an organization that exists in order to promulgate accounting standards for governmental entities.

Fiduciary Net Position

The fiduciary net position is the value of the assets of the trust.

Long-Term Expected Rate of Return

The long-term rate of return is the expected return to be earned over the entire trust portfolio based on the asset allocation of the portfolio.

Money-Weighted Rate of Return

The money-weighted rate of return is a method of calculating the returns that adjusts for the changing amounts actually invested. For purposes of GASB Statement No. 67, money-weighted rate of return is calculated as the internal rate of return on pension plan investments, net of pension plan investment expense.

Multiple-Employer Defined Benefit Pension Plan

A multiple-employer plan is a defined benefit pension plan that is used to provide pensions to the employees of more than one employer.

Municipal Bond Rate

The Municipal Bond Rate is the discount rate to be used for those benefit payments that occur after the assets of the trust have been depleted.

Net Pension Liability (NPL)

The NPL is the liability of employers and non-employer contribution entities to plan members for benefits provided through a defined benefit pension plan.

Non-Employer Contribution Entities

Non-employer contribution entities are entities that make contributions to a pension plan that is used to provide pensions to the employees of other entities. For purposes of the GASB Accounting statement plan members are not considered non-employer contribution entities.

Normal Cost

The actuarial present value of the pension trust benefits allocated to the current year by the actuarial cost method. Also known as service cost.

Glossary of Terms

<i>Other Postemployment Benefits (OPEB)</i>	All postemployment benefits other than retirement income (such as death benefits, life insurance, disability, and long-term care) that are provided separately from a pension plan, as well as postemployment healthcare benefits regardless of the manner in which they are provided. Other post-employment benefits do not include termination benefits.
<i>PERSIA</i>	Public Employees Retirement System Investment Act (Michigan PA 314).
<i>POA</i>	The 8 th Amended Plan for the Adjustment of the Debt of the City of Detroit.
<i>Real Rate of Return</i>	The real rate of return is the rate of return on an investment after adjustment to eliminate inflation.
<i>Service Cost</i>	The service cost is the portion of the actuarial present value of projected benefit payments that is attributed to a valuation year. Also known as normal cost.
<i>Total Pension Expense</i>	The total pension expense is the sum of the following items that are recognized at the end of the employer’s fiscal year: <ol style="list-style-type: none">1. Service Cost2. Interest on the Total Pension Liability3. Current-Period Benefit Changes4. Employee Contributions (made negative for addition here)5. Projected Earnings on Plan Investments (made negative for addition here)6. Pension Plan Administrative Expense7. Other Changes in Plan Fiduciary Net Position8. Recognition of Outflow (Inflow) of Resources due to Liabilities9. Recognition of Outflow (Inflow) of Resources due to Assets
<i>Total Pension Liability (TPL)</i>	The TPL is the portion of the actuarial present value of projected benefit payments that is attributed to past periods of member service.
<i>Unfunded Actuarial Accrued Liability (UAAL)</i>	The UAAL is the difference between actuarial accrued liability and valuation assets.
<i>Valuation Assets</i>	The valuation assets are the assets used in determining the unfunded liability of the plan. For purposes of the GASB Statement No. 67, the valuation asset is equal to the market value of assets.



October 15, 2019

Mr. David Cetlinski, Executive Director
The Police and Fire Retirement System
of the City of Detroit
One Detroit Center
500 Woodward Avenue, Suite 3000
Detroit, MI 48226-3534

Dear David:

Please find enclosed 30 copies of the GASB Statement Nos. 67 and 68 Accounting and Financial Reporting for Pension Plans of Component II report of the Police and Fire Retirement System of the City of Detroit.

Sincerely,

A handwritten signature in black ink that reads "Kenneth G. Alberts".

Kenneth G. Alberts

KGA:ah
Enclosures

cc: Cynthia A. Thomas, City of Detroit Retirement Systems
Lamonica Arrington-Cabeau, City of Detroit Retirement Systems
David T. Kausch, GRS
Judith A. Kermans, GRS