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, 2021

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October 21, 2021

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 a review by 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.

The Appendix of this report also provides some of the information necessary to complete the reporting requirements for the State of Michigan's Local Government Retirement System Annual Report (Form 5572). This information is not required to be included in your financial statements. The calculations in the Appendix are based on assumptions that satisfy the Uniform Assumptions criteria published by the Michigan Treasury for Fiscal Year 2021 reporting requirements.

This report is based upon information, furnished to us by the 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, 2020. The total pension liability was rolled-forward from the valuation date to the plan year ending June 30, 2021 using generally accepted actuarial principles. The asset information as of June 30, 2021 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 any data received for the purposes of completing this report, including any member or financial data. As discussed in the June 30, 2020 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 6.88% as of June 30, 2021, down from 7.15% as of June 30, 2020. We have reviewed this assumption based on the System's asset allocation and have determined it does not significantly conflict with what, in our professional judgment, would be reasonable for purposes of the measurement.

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, 2021.

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.

This report was prepared using our proprietary valuation model and related software which in our professional judgment has the capability to provide results that are consistent with the purposes of the valuation. We performed tests to ensure that the model reasonably represents that which is intended to be modeled. We are relying on the GRS actuaries and Internal Software, Training, and Processes Team who developed and maintain the model.

The signing actuaries are independent of the plan sponsor.

David T. Kausch, Jamal Adora, 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,
Gabriel, Roeder, Smith & Company

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Senior Consultant and Chief Actuary

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DTK/JAK/JJA:bd

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SECTION A

EXECUTIVE SUMMARY

Executive Summary
as of June 30, 2021

Actuarial Valuation Date	June 30, 2020
Measurement Date of the Net Pension Liability	June 30, 2021
Employer's Fiscal Year Ending Date (GASB No. 68 Reporting Date)	June 30, 2022
Membership	
Number of	
- Retirees and Beneficiaries	7,960
- DROP Members	757
- Inactive, Nonretired Members	389
- Active Members	1,369
- Total	10,475
Covered Payroll^	$ 71,842,120
Net Pension Liability	
Total Pension Liability	$ 3,595,499,958
Plan Fiduciary Net Position	2,749,073,539
Net Pension Liability	$ 846,426,419
Plan Fiduciary Net Position as a Percentage of Total Pension Liability	76.46%
Net Pension Liability as a Percentage of Covered Payroll	1,178.18%
Development of the Single Discount Rate	
Single Discount Rate	6.88%
Long-Term Expected Rate of Investment Return	6.88%
Long-Term Municipal Bond Rate*	1.92%
Last year ending June 30 in the 2022 to 2121 projection period for which projected benefit payments are fully funded	2121
Total Pension Expense	$ 44,433,123

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	128,758,858	369,744,111
Total	$ 128,758,858	$ 369,744,111

*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 30, 2021. 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.*

^Based on the June 30, 2020 census data. Excludes DROP covered payroll. Covered employee payroll for employer's disclosure may differ.

Discussion

Changes Compared to Funding Valuation

For purposes of determining the Total Pension Liability (TPL) as of June 30, 2021, we note the following differences from the June 30, 2020 funding valuation:

- At the direction of the System and approval of the Systems' Auditor, the long-term expected return on assets was 6.88% as of June 30, 2021. It was 6.75% in the June 30, 2020 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 "Contingency Reserve" comment on page 7).
- Administrative expenses are shared 60% with Component II and 40% with Component I. This is the same assumption used in the prior GASB report.
- The funding valuation includes a liability 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, excess Annuity Savings Fund (ASF) earnings that are expected to be transferred to Component I after the valuation date are not reflected in the TPL and will be reflected in the assets, once it occurs. Based on the return for the 2019 and 2020 fiscal year, the June 30, 2020 funding valuation included $0 in liabilities to account for this activity.

Changes Compared to Prior Year's GASB Report

The changes in actuarial assumptions compared to the June 30, 2020 GASB No. 68 reporting were:

- The change in the long-term expected rate of investment return from 7.15% to 6.88%.

These changes increased the TPL by $87 million resulting in a new deferred outflow for recognition in the pension expense.

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, 2021.

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, 2020 rolled-forward to the plan year end of June 30, 2021.

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 6.88%; the municipal bond rate is 1.92% (based on the “20-Year Municipal GO AA Index” from the Fidelity Index); and the resulting Single Discount Rate is 6.88% as of June 30, 2021.

The projection of contributions used to determine this Single Discount Rate reflect that plan member contributions ceased prior to June 30, 2020 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 6.88% was applied to all periods of projected benefit payments to determine the total pension liability. Note projections are shown with a 6.88% 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). Although the Police and Fire Retirement System (PFRS) Board has adopted a funding policy that uses a 20-year closed level dollar amortization beginning in fiscal year 2024 (the first year that actuarially determined contributions will be in effect since the bankruptcy), as a result of the timing of the PFRS Investment Committee's decision regarding the Funding Policy, we have not incorporated that policy in the projection of this report. No required employer contributions have yet been determined based on this policy. Additionally, since the 30-year policy used in this report results in a fiduciary net position that is projected to be sufficient to pay benefits in all years, the Board Adopted 20-year policy would also result in a fiduciary net position that is projected to be sufficient to pay benefits in all years. Had we used the Board Adopted 20-year policy in our projection of the fiduciary net position, the Single Discount Rate and resulting Total Pension Liability would be the same as the one we have calculated under the 30-year period. The amortization method used in the projections is unchanged from the June 30, 2020 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 (76.46% as of June 30, 2021). 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) of GASB Statement No. 67. If so, the amount of the reserve is $26,894,729 as of June 30, 2020. The projections in Section G show the Net Plan Position as of June 30, 2021 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, 2021

Assets		
Cash and Cash Equivalents	$	163,457,704
Receivables	$	82,679,210
Investments		
Investments at Fair Value	$	2,585,555,602
Cash and Investments held as Collateral for Securities Lending		141,480,225
Capital Assets - Net		2,647,696
Total Investments	$	2,729,683,523
Total Assets	$	2,975,820,437
Liabilities		
Payables		
Accounts Payable	$	226,746,898
Total Liabilities	$	226,746,898
Net Position Restricted for Pensions	$	2,749,073,539

Statement of Changes in Fiduciary Net Position for Year Ended June 30, 2021

Additions		
Contributions		
Employer	$	18,300,000
Employee		-
Other		-
Total Contributions	$	18,300,000
Investment Income		
Investment Income - Net	$	609,648,877
Annuity Interest		5,164,889
Annuity Loan Interest		319,504
Total Investment Income	$	615,133,270
Other	$	1,255,632
Total Additions	$	634,688,902
Deductions		
Benefit Payments, including Refunds of Employee Contributions	$	300,892,657
Pension Plan Administrative Expense		1,970,846
Transfers Out		-
Total Deductions	$	302,863,503
Net Increase in Net Position	$	331,825,399
Net Position Restricted for Pensions		
Beginning of Year	$	2,417,248,140
End of Year	$	2,749,073,539

Statement of Pension Expense Under GASB Statement No. 68
Fiscal Year Ended June 30, 2021

A. Expense		
1. Service Cost	$	-
2. Interest on the Total Pension Liability		248,397,228
3. Current-Period Benefit Changes		-
4. Employee Contributions (made negative for addition here)		-
5. Projected Earnings on Plan Investments (made negative for addition here)		(162,704,986)
6. Pension Plan Administrative Expense		1,970,846
7. Other Changes in Plan Fiduciary Net Position		(1,255,632)
8. Recognition of Outflow (Inflow) of Resources due to Liabilities		23,461,949
9. Recognition of Outflow (Inflow) of Resources due to Assets		(65,436,282)
10. Total Pension Expense	**$**	**44,433,123**

Statement of Outflows and Inflows Arising from Current Reporting Period Fiscal Year Ended June 30, 2021

A. Outflows (Inflows) of Resources due to Liabilities	
1. Difference between expected and actual experience of the Total Pension Liability (gains) or losses	$ (63,747,219)
2. Assumption Changes (gains) or losses	$ 87,209,168
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	$ (63,747,219)
5. Outflow (Inflow) of Resources to be recognized in the current pension expense for Assumption Changes	$ 87,209,168
6. Outflow (Inflow) of Resources to be recognized in the current pension expense due to Liabilities	$ 23,461,949
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	$ -
B. Outflows (Inflows) of Resources due to Assets	
1. Net difference between projected and actual earnings on pension plan investments (gains) or losses	$ (452,428,284)
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	$ (90,485,657)
4. Deferred Outflow (Inflow) of Resources to be recognized in future pension expenses due to Assets	$ (361,942,627)

* *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, 2021

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	$ 87,209,168	$ 63,747,219	$ 23,461,949
2. Due to Assets	49,360,513	114,796,795	(65,436,282)
3. Total	$ 136,569,681	$ 178,544,014	$ (41,974,333)

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	$ -	$ 63,747,219	$ (63,747,219)
2. Assumption Changes	87,209,168	-	87,209,168
3. Net Difference between projected and actual earnings on pension plan investments	49,360,513	114,796,795	(65,436,282)
4. Total	$ 136,569,681	$ 178,544,014	$ (41,974,333)

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	128,758,858	369,744,111	(240,985,253)
4. Total	$ 128,758,858	$ 369,744,111	$ (240,985,253)

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
2022	$ (48,926,628)
2023	(41,125,146)
2024	(60,447,823)
2025	(90,485,656)
2026	-
Thereafter	-
Total	$ (240,985,253)

Recognition of Deferred Outflows and Inflows of Resources
Fiscal Year Ended June 30, 2021

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					
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	0	0	0.0000
2020	(6,362,993)	1.0000	0	0	0.0000
2021	(63,747,219)	1.0000	(63,747,219)	0	0.0000
Total			**$ (63,747,219)**	**$ 0**	
Deferred Outflow (Inflow) due to Assumption Changes					
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
2020	13,171,037	1.0000	0	0	0.0000
2021	87,209,168	1.0000	87,209,168	0	0.0000
Total			**$ 87,209,168**	**$ 0**	
Deferred Outflow (Inflow) due to Differences Between Projected and Actual Earnings on Plan Investments					
2017	$ (82,548,261)	5.0000	$ (16,509,653)	$ 0	0.0000
2018	(39,007,424)	5.0000	(7,801,485)	(7,801,484)	1.0000
2019	96,613,383	5.0000	19,322,677	38,645,352	2.0000
2020	150,189,178	5.0000	30,037,836	90,113,506	3.0000
2021	(452,428,284)	5.0000	(90,485,657)	(361,942,627)	4.0000
Total			**$ (65,436,282)**	**(240,985,253)**	

SECTION C

REQUIRED SUPPLEMENTARY INFORMATION

Schedule of Changes in Net Pension Liability and Related Ratios
Current Period
Fiscal Year Ended June 30, 2021

A. Total pension liability		
1. Service Cost	$	-
2. Interest on the Total Pension Liability		248,397,228
3. Changes of benefit terms		-
4. Difference between expected and actual experience of the Total Pension Liability		(63,747,219)
5. Changes of assumptions		87,209,168
6. Benefit payments, including refunds of employee contributions		(300,892,657)
7. Net change in total pension liability	$	(29,033,480)
8. Total pension liability – beginning		3,624,533,438
9. Total pension liability – ending	**$**	**3,595,499,958**
B. Plan fiduciary net position		
1. Contributions – employer	$	18,300,000
2. Contributions – employee		-
3. Net investment income		615,133,270
4. Benefit payments, including refunds of employee contributions		(300,892,657)
5. Pension plan administrative expense		(1,970,846)
6. Other		1,255,632
7. Net change in plan fiduciary net position	$	331,825,399
8. Plan fiduciary net position – beginning		2,417,248,140
9. Plan fiduciary net position – ending	**$**	**2,749,073,539**
C. Net pension liability	**$**	**846,426,419**
D. Plan fiduciary net position as a percentage of the total pension liability		**76.46%**
E. Covered-employee payroll	**$**	**71,842,120**
F. Net pension liability as a percentage of covered-employee payroll		**1,178.18%**

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

Ultimately 10 Fiscal Years will be Displayed

Fiscal year ending June 30,	2021	2020	2019	2018	2017	2016	2015	2014
Total Pension Liability								
Service Cost	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ 34,967,708
Interest on the Total Pension Liability	248,397,228	253,048,801	256,873,504	257,841,119	261,449,503	264,233,822	306,063,331	304,737,368
Benefit Changes	-	(4,490,368)	(3,111,623)	-	-	-	(555,898,068)	(102,236,878)
Difference between Expected and Actual Experience	(63,747,219)	(6,362,993)	(3,862,962)	32,674,674	(10,648,606)	45,955,554	(59,621,651)	-
Assumption Changes*	87,209,168	13,171,037	-	(6,975,457)	(4,082,068)	114,463,362	(95,014,469)	540,356,835
Benefit Payments	(284,426,216)	(286,551,161)	(286,557,514)	(288,443,573)	(286,667,369)	(285,936,674)	(313,816,916)	(285,512,629)
Refunds	(16,466,441)	(14,024,530)	(19,054,169)	(19,947,151)	(19,431,502)	(18,530,489)	-	(38,027,844)
Net Change in Total Pension Liability	(29,033,480)	(45,209,214)	(55,712,764)	(24,850,388)	(59,380,042)	120,185,575	(718,287,774)	454,284,561
Total Pension Liability - Beginning	3,624,533,438	3,669,742,652	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)	$ 3,595,499,958	$ 3,624,533,438	$ 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	$ 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	615,133,270	31,591,980	98,891,894	237,991,220	282,398,412	24,649,809	122,736,820	568,760,793
Benefit Payments	(284,426,216)	(286,551,161)	(286,557,514)	(288,443,573)	(286,667,369)	(285,936,673)	(313,816,916)	(285,512,629)
Refunds	(16,466,441)	(14,024,530)	(19,054,169)	(19,947,151)	(19,431,502)	(18,530,489)	-	(38,027,844)
Pension Plan Administrative Expense	(1,970,846)	(2,449,246)	(3,180,514)	(4,933,928)	(4,433,657)	(3,103,694)	(7,630,692)	(11,373,226)
Other	1,255,632	(462,259)	(3,863,746)	1,153,145	(18,508,411)	824,511	2,919,354	-
Net Change in Plan Fiduciary Net Position	331,825,399	(253,595,216)	(195,460,449)	(55,838,173)	(28,328,472)	(244,283,991)	(81,448,858)	241,630,235
Plan Fiduciary Net Position - Beginning	2,417,248,140	2,670,843,356	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)	$ 2,749,073,539	$ 2,417,248,140	$ 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)	846,426,419	1,207,285,298	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	76.46 %	66.69 %	72.78 %	76.94 %	77.92 %	77.45 %	86.59 %	74.33 %
Covered Employee Payroll (excluding DROP)	$ 71,842,120	$ 105,233,078	$ 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	1,178.18 %	1,147.25 %	896.62 %	738.81 %	652.79 %	637.59 %	373.21 %	753.50 %

Notes to Schedule:

* *For the fiscal years ending 2016, 2017, 2018, 2020, and 2021, 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%
2020	3,624,533,438	2,417,248,140	1,207,285,298	66.69%	105,233,078	1,147.25%
2021	3,595,499,958	2,749,073,539	846,426,419	76.46%	71,842,120	1,178.18%

* *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%
2020	N/A	18,300,000	N/A	105,233,078	17.39%
2021	N/A	18,300,000	N/A	71,842,120	25.47%

* *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)
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 6.88% was used to measure the total pension liability as of June 30, 2021. This Single Discount Rate was based on the expected rate of return on pension plan investments of 6.88% 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, 2021 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 6.88%, 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 5.88%	Current Single Discount Rate Assumption 6.88%	1% Increase 7.88%
Total Pension Liability (TPL)	$3,956,543,060	$3,595,499,958	$3,291,207,664
Net Position Restricted for Pensions	2,749,073,539	2,749,073,539	2,749,073,539
Net Pension Liability (NPL)	$1,207,469,521	$ 846,426,419	$ 542,134,125

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 will be provided by the plan's investment consultant.

Notes to Financial Statements

Summary of Population Statistics

Inactive Plan Members or Beneficiaries Currently Receiving Benefits	7,960
DROP Members	757
Inactive Plan Members Entitled to But Not Yet Receiving Benefits	389
Active Plan Members	1,369
Total Plan Members	10,475

Additional information regarding the plan population may be found in the June 30, 2020 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. Effective May 9, 2019, DPOA members are limited to 10 years of DROP participation.

SECTION F

ACTUARIAL COST METHOD AND ACTUARIAL ASSUMPTIONS

Summary of Assumptions Used for PFRS 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, 2020 TPL:
The investment return rate used in the valuation was 6.88% 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 2.25% 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 pages 36-37 of the June 30, 2020 actuarial valuation issued June 8, 2021.

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

Sample Attained Ages in 2020	Future Life Expectancy (years)	
	Men	Women
45	39.81	43.14
50	34.82	38.06
55	30.01	33.13
60	25.42	28.35
65	21.06	23.73
70	16.99	19.36
75	13.27	15.31
80	9.97	11.69

Probabilities of Service Retirement

	Percent of Eligible Active Members Retiring within Next Year			
	Police		Fire	
Service	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%

	Percent of Eligible Active Members Retiring within Next Year	
Age	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 withdrawal rates for members with less than 5 years of service are shown for completeness. Given the demographics of this closed group, there is likely no one being exposed to the rates. 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 assumed to be 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.

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 PFRS 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 Police members, 65% of eligible members are assumed to enter the DROP and remain in the DROP for seven years. For Fire 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.
Data Assumptions:	Assumptions regarding incomplete or missing data are reviewed annually with the System and adjusted as directed by the System.

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 6.88%; the municipal bond rate is 1.92%; and the resulting SDR is 6.88% as of June 30, 2021.

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, 2021, 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 6.88% 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 6.88% 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 6.88% 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, 2021, the benefit payments reflect the plan provisions in force as of June 30, 2021.

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
2022	$ -	$ -	$ 2,360,765	$ 15,939,235	$ 18,300,000
2023	-	-	2,297,862	16,002,138	18,300,000
2024	-	-	2,251,403	74,224,131	76,475,534
2025	-	-	2,211,752	74,224,131	76,435,883
2026	-	-	2,183,470	74,224,131	76,407,601
2027	-	-	2,149,587	74,224,131	76,373,718
2028	-	-	2,109,124	74,224,131	76,333,255
2029	-	-	2,066,390	74,224,131	76,290,521
2030	-	-	2,025,371	74,224,131	76,249,502
2031	-	-	1,980,899	74,224,131	76,205,030
2032	-	-	1,928,572	74,224,131	76,152,703
2033	-	-	1,874,112	74,224,131	76,098,243
2034	-	-	1,821,873	74,224,131	76,046,004
2035	-	-	1,775,224	74,224,131	75,999,355
2036	-	-	1,737,589	74,224,131	75,961,720
2037	-	-	1,702,794	74,224,131	75,926,925
2038	-	-	1,669,258	74,224,131	75,893,389
2039	-	-	1,631,121	74,224,131	75,855,252
2040	-	-	1,583,215	74,224,131	75,807,346
2041	-	-	1,519,554	74,224,131	75,743,685
2042	-	-	1,421,474	74,224,131	75,645,605
2043	-	-	1,292,621	74,224,131	75,516,752
2044	-	-	1,149,074	74,224,131	75,373,205
2045	-	-	981,703	74,224,131	75,205,834
2046	-	-	809,379	74,224,131	75,033,510
2047	-	-	655,523	74,224,131	74,879,654
2048	-	-	516,748	74,224,131	74,740,879
2049	-	-	395,241	74,224,131	74,619,372
2050	-	-	292,533	74,224,131	74,516,664
2051	-	-	211,245	74,224,131	74,435,376
2052	-	-	149,780	74,224,131	74,373,911
2053	-	-	104,064	74,224,131	74,328,195
2054	-	-	71,137	-	71,137
2055	-	-	47,262	-	47,262
2056	-	-	29,773	-	29,773
2057	-	-	17,458	-	17,458
2058	-	-	9,446	-	9,446
2059	-	-	4,536	-	4,536
2060	-	-	1,923	-	1,923
2061	-	-	609	-	609
2062	-	-	92	-	92
2063	-	-	-	-	-
2064	-	-	-	-	-
2065	-	-	-	-	-
2066	-	-	-	-	-
2067	-	-	-	-	-
2068	-	-	-	-	-
2069	-	-	-	-	-
2070	-	-	-	-	-
2071	-	-	-	-	-

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
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	-	-	-	-	-
2120	-	-	-	-	-
2121	-	-	-	-	-

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 6.88%	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)
2022	$ 2,749,073,539	$ 18,300,000	$ 311,323,118	$ 27,184,529	$ 2,360,765	$ 177,273,766	$ 2,603,778,893	$ 2,632,833,717
2023	2,603,778,893	18,300,000	308,948,649	-	2,297,862	169,230,240	2,480,062,622	2,511,116,419
2024	2,480,062,622	76,475,534	307,919,857	-	2,251,403	162,722,887	2,409,089,783	2,442,280,081
2025	2,409,089,783	76,435,883	304,205,352	-	2,211,752	157,965,609	2,337,074,172	2,372,547,962
2026	2,337,074,172	76,407,601	300,732,428	-	2,183,470	153,128,417	2,263,694,293	2,301,608,680
2027	2,263,694,293	76,373,718	298,387,622	-	2,149,587	148,159,201	2,187,690,004	2,228,212,900
2028	2,187,690,004	76,333,255	295,303,364	-	2,109,124	143,034,440	2,109,645,210	2,152,956,082
2029	2,109,645,210	76,290,521	292,057,282	-	2,066,390	137,774,766	2,029,586,826	2,075,877,486
2030	2,029,586,826	76,249,502	288,195,984	-	2,025,371	132,397,368	1,948,012,341	1,997,487,798
2031	1,948,012,341	76,205,030	283,843,688	-	1,980,899	126,932,273	1,865,325,057	1,918,204,425
2032	1,865,325,057	76,152,703	279,008,688	-	1,928,572	121,406,945	1,781,947,445	1,838,464,914
2033	1,781,947,445	76,098,243	273,623,602	-	1,874,112	115,852,731	1,698,400,705	1,758,806,577
2034	1,698,400,705	76,046,004	267,926,125	-	1,821,873	110,297,449	1,614,996,161	1,679,557,956
2035	1,614,996,161	75,999,355	261,808,635	-	1,775,224	104,766,158	1,532,177,815	1,601,181,462
2036	1,532,177,815	75,961,720	255,247,680	-	1,737,589	99,290,198	1,450,444,465	1,524,195,563
2037	1,450,444,465	75,926,925	248,169,290	-	1,702,794	93,906,390	1,370,405,696	1,449,230,870
2038	1,370,405,696	75,893,389	240,592,231	-	1,669,258	88,656,039	1,292,693,636	1,376,941,981
2039	1,292,693,636	75,855,252	232,757,445	-	1,631,121	83,574,483	1,217,734,804	1,307,779,436
2040	1,217,734,804	75,807,346	224,631,517	-	1,583,215	78,692,198	1,146,019,616	1,242,259,318
2041	1,146,019,616	75,743,685	216,188,728	-	1,519,554	74,043,794	1,078,098,814	1,180,959,808
2042	1,078,098,814	75,645,605	207,446,171	-	1,421,474	69,666,585	1,014,543,360	1,124,481,190
2043	1,014,543,360	75,516,752	198,471,499	-	1,292,621	65,597,563	955,893,555	1,073,395,108
2044	955,893,555	75,373,205	189,337,111	-	1,149,074	61,871,453	902,652,029	1,028,237,689
2045	902,652,029	75,205,834	180,191,312	-	981,703	58,517,819	855,202,668	989,428,620
2046	855,202,668	75,033,510	171,036,652	-	809,379	55,562,985	813,953,132	957,413,830
2047	813,953,132	74,879,654	161,997,473	-	655,523	53,030,793	779,210,584	932,541,378
2048	779,210,584	74,740,879	153,046,712	-	516,748	50,943,291	751,331,294	915,211,247
2049	751,331,294	74,619,372	144,336,313	-	395,241	49,319,849	730,538,962	905,693,856
2050	730,538,962	74,516,664	135,867,068	-	292,533	48,175,833	717,071,858	904,277,409
2051	717,071,858	74,435,376	127,679,330	-	211,245	47,526,270	711,142,930	911,228,222
2052	711,142,930	74,373,911	119,775,916	-	149,780	47,385,715	712,976,860	926,828,020
2053	712,976,860	74,328,195	112,165,765	-	104,064	47,769,324	722,804,550	951,368,670
2054	722,804,550	71,137	104,828,862	-	71,137	46,182,819	664,158,508	908,447,839
2055	664,158,508	47,262	97,812,567	-	47,262	42,385,318	608,731,258	869,827,695
2056	608,731,258	29,773	91,055,666	-	29,773	38,800,494	556,476,086	835,535,959
2057	556,476,086	17,458	84,635,629	-	17,458	35,422,514	507,262,972	805,522,164
2058	507,262,972	9,446	78,479,392	-	9,446	32,244,904	461,028,484	779,807,908
2059	461,028,484	4,536	72,603,050	-	4,536	29,262,755	417,688,189	758,399,638
2060	417,688,189	1,923	67,001,976	-	1,923	26,470,415	377,156,629	741,309,025
2061	377,156,629	609	61,654,883	-	609	23,862,725	339,364,470	728,570,551
2062	339,364,470	92	56,555,228	-	92	21,435,134	304,244,376	720,227,836
2063	304,244,376	-	51,698,806	-	-	19,183,154	271,728,725	716,331,846
2064	271,728,725	-	47,083,992	-	-	17,102,187	241,746,920	716,938,736
2065	241,746,920	-	42,711,494	-	-	15,187,351	214,222,776	722,107,789
2066	214,222,776	-	38,575,408	-	-	13,433,604	189,080,972	731,908,474
2067	189,080,972	-	34,683,816	-	-	11,835,492	166,232,648	746,406,682
2068	166,232,648	-	31,048,789	-	-	10,386,493	145,570,352	765,660,359
2069	145,570,352	-	27,662,427	-	-	9,079,480	126,987,405	789,739,605
2070	126,987,405	-	24,525,223	-	-	7,907,098	110,369,280	818,718,832
2071	110,369,280	-	21,636,308	-	-	6,861,497	95,594,470	852,678,470

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 6.88%	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)
2072	$ 95,594,470	$ -	$ 18,993,069	$ -	$ -	$ 5,934,405	$ 82,535,806	$ 891,707,185
2073	82,535,806	-	16,590,828	-	-	5,117,232	71,062,209	935,904,580
2074	71,062,209	-	14,422,984	-	-	4,401,182	61,040,407	985,383,932
2075	61,040,407	-	12,481,013	-	-	3,777,374	52,336,768	1,040,275,128
2076	52,336,768	-	10,754,377	-	-	3,236,972	44,819,363	1,100,727,883
2077	44,819,363	-	9,230,707	-	-	2,771,317	38,359,974	1,166,914,999
2078	38,359,974	-	7,896,332	-	-	2,372,050	32,835,693	1,239,035,304
2079	32,835,693	-	6,736,673	-	-	2,031,209	28,130,228	1,317,316,372
2080	28,130,228	-	5,736,560	-	-	1,741,304	24,134,972	1,402,017,123
2081	24,134,972	-	4,880,494	-	-	1,495,389	20,749,867	1,493,430,311
2082	20,749,867	-	4,152,846	-	-	1,287,109	17,884,130	1,591,884,988
2083	17,884,130	-	3,538,269	-	-	1,110,736	15,456,597	1,697,748,714
2084	15,456,597	-	3,022,092	-	-	961,183	13,395,689	1,811,429,503
2085	13,395,689	-	2,590,414	-	-	833,995	11,639,270	1,933,377,811
2086	11,639,270	-	2,230,153	-	-	725,341	10,134,458	2,064,088,610
2087	10,134,458	-	1,929,388	-	-	631,984	8,837,053	2,204,103,251
2088	8,837,053	-	1,677,524	-	-	551,242	7,710,772	2,354,011,284
2089	7,710,772	-	1,465,289	-	-	480,934	6,726,416	2,514,452,404
2090	6,726,416	-	1,284,784	-	-	419,316	5,860,948	2,686,118,484
2091	5,860,948	-	1,129,503	-	-	365,025	5,096,470	2,869,755,724
2092	5,096,470	-	994,287	-	-	317,003	4,419,185	3,066,166,996
2093	4,419,185	-	875,195	-	-	274,434	3,818,424	3,276,214,485
2094	3,818,424	-	769,304	-	-	236,684	3,285,804	3,500,822,713
2095	3,285,804	-	674,518	-	-	203,246	2,814,531	3,740,981,980
2096	2,814,531	-	589,381	-	-	173,702	2,398,853	3,997,752,222
2097	2,398,853	-	512,888	-	-	147,691	2,033,656	4,272,267,337
2098	2,033,656	-	444,238	-	-	124,888	1,714,306	4,565,740,064
2099	1,714,306	-	382,821	-	-	104,994	1,436,479	4,879,467,210
2100	1,436,479	-	328,130	-	-	87,730	1,196,079	5,214,835,324
2101	1,196,079	-	279,680	-	-	72,829	989,227	5,573,326,852
2102	989,227	-	236,983	-	-	60,042	812,287	5,956,526,740
2103	812,287	-	199,526	-	-	49,136	661,896	6,366,129,504
2104	661,896	-	166,830	-	-	39,895	534,961	6,803,946,741
2105	534,961	-	138,455	-	-	32,122	428,628	7,271,915,138
2106	428,628	-	114,003	-	-	25,633	340,258	7,772,105,040
2107	340,258	-	93,078	-	-	20,261	267,441	8,306,729,640
2108	267,441	-	75,300	-	-	15,853	207,993	8,878,154,791
2109	207,993	-	60,335	-	-	12,269	159,927	9,488,909,465
2110	159,927	-	47,855	-	-	9,384	121,456	10,141,696,962
2111	121,456	-	37,549	-	-	7,086	90,993	10,839,406,894
2112	90,993	-	29,131	-	-	5,275	67,138	11,585,127,972
2113	67,138	-	22,336	-	-	3,863	48,665	12,382,161,685
2114	48,665	-	16,927	-	-	2,776	34,514	13,234,036,909
2115	34,514	-	12,669	-	-	1,946	23,790	14,144,525,551
2116	23,790	-	9,354	-	-	1,320	15,757	15,117,659,239
2117	15,757	-	6,804	-	-	854	9,807	16,157,747,160
2118	9,807	-	4,871	-	-	510	5,445	17,269,395,129
2119	5,445	-	3,424	-	-	259	2,280	18,457,525,973
2120	2,280	-	2,357	-	-	77	0	19,727,401,324
2121	0	-	-	-	-	0	0	21,084,646,535

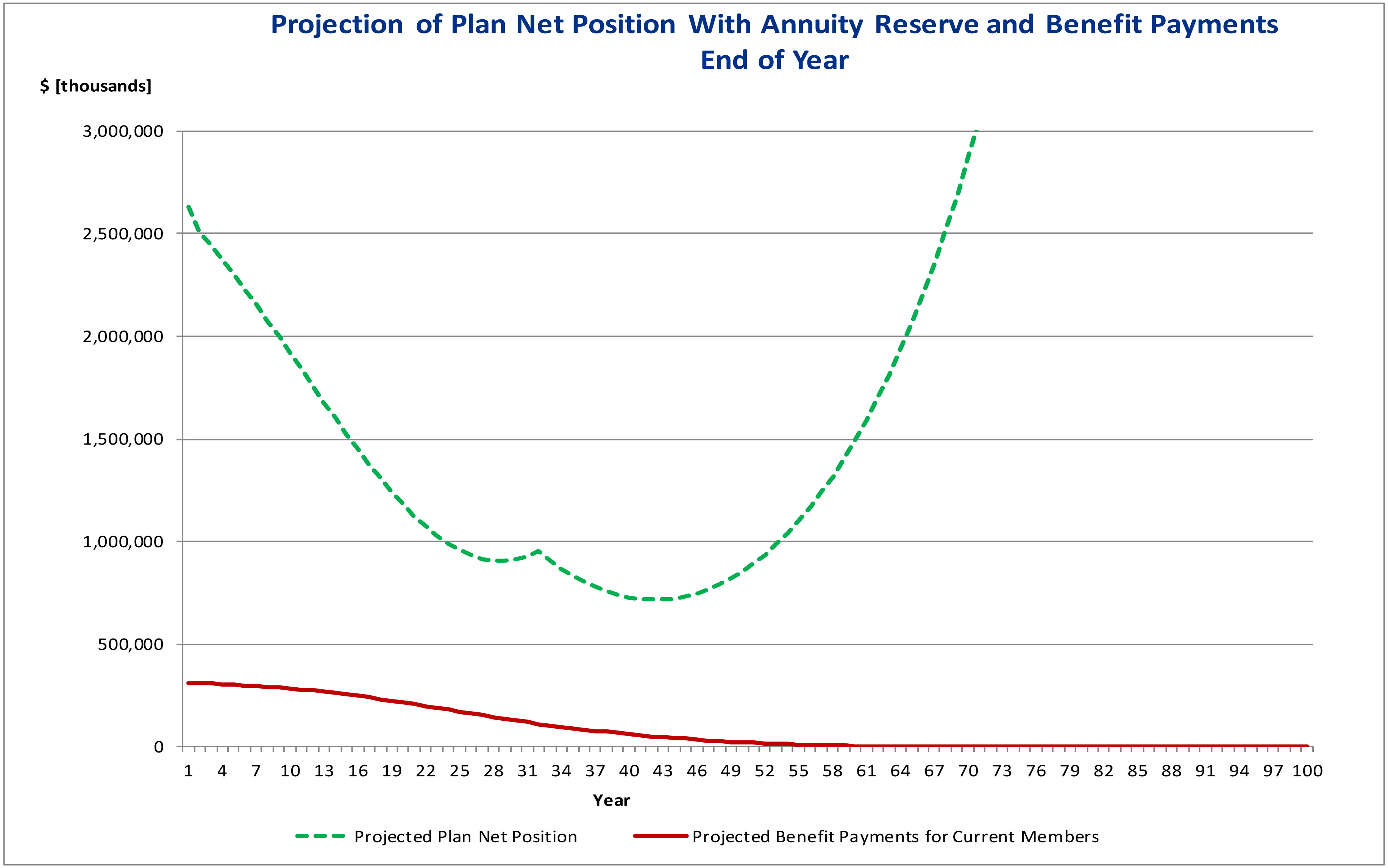
Employer contributions as shown may differ substantially from those determined by a funding valuation.

Single Discount Rate Development
Present Values of Projected Benefits
End of Year

Fiscal Year 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)-.5)	(g)=(e)*vf ^((a)-.5)	(h)=(c)/(1+sdr)^(a-.5)
2022	$ 2,749,073,539	$ 311,323,118	$ 311,323,118	$ -	$ 301,136,327	$ -	$ 301,136,327
2023	2,632,833,717	308,948,649	308,948,649	-	279,602,875	-	279,602,875
2024	2,511,116,419	307,919,857	307,919,857	-	260,733,350	-	260,733,350
2025	2,442,280,081	304,205,352	304,205,352	-	241,006,798	-	241,006,798
2026	2,372,547,962	300,732,428	300,732,428	-	222,918,575	-	222,918,575
2027	2,301,608,680	298,387,622	298,387,622	-	206,942,816	-	206,942,816
2028	2,228,212,900	295,303,364	295,303,364	-	191,620,294	-	191,620,294
2029	2,152,956,082	292,057,282	292,057,282	-	177,314,683	-	177,314,683
2030	2,075,877,486	288,195,984	288,195,984	-	163,707,336	-	163,707,336
2031	1,997,487,798	283,843,688	283,843,688	-	150,856,148	-	150,856,148
2032	1,918,204,425	279,008,688	279,008,688	-	138,741,074	-	138,741,074
2033	1,838,464,914	273,623,602	273,623,602	-	127,304,700	-	127,304,700
2034	1,758,806,577	267,926,125	267,926,125	-	116,629,791	-	116,629,791
2035	1,679,557,956	261,808,635	261,808,635	-	106,630,626	-	106,630,626
2036	1,601,181,462	255,247,680	255,247,680	-	97,266,513	-	97,266,513
2037	1,524,195,563	248,169,290	248,169,290	-	88,481,635	-	88,481,635
2038	1,449,230,870	240,592,231	240,592,231	-	80,258,355	-	80,258,355
2039	1,376,941,981	232,757,445	232,757,445	-	72,646,683	-	72,646,683
2040	1,307,779,436	224,631,517	224,631,517	-	65,597,374	-	65,597,374
2041	1,242,259,318	216,188,728	216,188,728	-	59,068,013	-	59,068,013
2042	1,180,959,808	207,446,171	207,446,171	-	53,030,814	-	53,030,814
2043	1,124,481,190	198,471,499	198,471,499	-	47,470,585	-	47,470,585
2044	1,073,395,108	189,337,111	189,337,111	-	42,370,709	-	42,370,709
2045	1,028,237,689	180,191,312	180,191,312	-	37,728,313	-	37,728,313
2046	989,428,620	171,036,652	171,036,652	-	33,506,285	-	33,506,285
2047	957,413,830	161,997,473	161,997,473	-	29,692,645	-	29,692,645
2048	932,541,378	153,046,712	153,046,712	-	26,246,307	-	26,246,307
2049	915,211,247	144,336,313	144,336,313	-	23,159,190	-	23,159,190
2050	905,693,856	135,867,068	135,867,068	-	20,396,963	-	20,396,963
2051	904,277,409	127,679,330	127,679,330	-	17,933,930	-	17,933,930
2052	911,228,222	119,775,916	119,775,916	-	15,740,841	-	15,740,841
2053	926,828,020	112,165,765	112,165,765	-	13,791,843	-	13,791,843
2054	951,368,670	104,828,862	104,828,862	-	12,059,975	-	12,059,975
2055	908,447,839	97,812,567	97,812,567	-	10,528,433	-	10,528,433
2056	869,827,695	91,055,666	91,055,666	-	9,170,217	-	9,170,217
2057	835,535,959	84,635,629	84,635,629	-	7,974,977	-	7,974,977
2058	805,522,164	78,479,392	78,479,392	-	6,918,873	-	6,918,873
2059	779,807,908	72,603,050	72,603,050	-	5,988,777	-	5,988,777
2060	758,399,638	67,001,976	67,001,976	-	5,170,999	-	5,170,999
2061	741,309,025	61,654,883	61,654,883	-	4,452,028	-	4,452,028
2062	728,570,551	56,555,228	56,555,228	-	3,820,909	-	3,820,909
2063	720,227,836	51,698,806	51,698,806	-	3,267,970	-	3,267,970
2064	716,331,846	47,083,992	47,083,992	-	2,784,674	-	2,784,674
2065	716,938,736	42,711,494	42,711,494	-	2,363,466	-	2,363,466
2066	722,107,789	38,575,408	38,575,408	-	1,997,187	-	1,997,187
2067	731,908,474	34,683,816	34,683,816	-	1,680,113	-	1,680,113
2068	746,406,682	31,048,789	31,048,789	-	1,407,213	-	1,407,213
2069	765,660,359	27,662,427	27,662,427	-	1,173,030	-	1,173,030
2070	789,739,605	24,525,223	24,525,223	-	973,050	-	973,050
2071	818,718,832	21,636,308	21,636,308	-	803,173	-	803,173

Single Discount Rate Development
Present Values of Projected Benefits
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)-.5)	(g)=(e)*vf ^((a)-.5)	(h)=(c)/(1+sdr)^(a-.5)
2072	$ 852,678,470	$ 18,993,069	$ 18,993,069	$ -	$ 659,667	$ -	$ 659,667
2073	891,707,185	16,590,828	16,590,828	-	539,139	-	539,139
2074	935,904,580	14,422,984	14,422,984	-	438,522	-	438,522
2075	985,383,932	12,481,013	12,481,013	-	355,050	-	355,050
2076	1,040,275,128	10,754,377	10,754,377	-	286,239	-	286,239
2077	1,100,727,883	9,230,707	9,230,707	-	229,870	-	229,870
2078	1,166,914,999	7,896,332	7,896,332	-	183,982	-	183,982
2079	1,239,035,304	6,736,673	6,736,673	-	146,859	-	146,859
2080	1,317,316,372	5,736,560	5,736,560	-	117,006	-	117,006
2081	1,402,017,123	4,880,494	4,880,494	-	93,138	-	93,138
2082	1,493,430,311	4,152,846	4,152,846	-	74,150	-	74,150
2083	1,591,884,988	3,538,269	3,538,269	-	59,110	-	59,110
2084	1,697,748,714	3,022,092	3,022,092	-	47,237	-	47,237
2085	1,811,429,503	2,590,414	2,590,414	-	37,883	-	37,883
2086	1,933,377,811	2,230,153	2,230,153	-	30,515	-	30,515
2087	2,064,088,610	1,929,388	1,929,388	-	24,700	-	24,700
2088	2,204,103,251	1,677,524	1,677,524	-	20,093	-	20,093
2089	2,354,011,284	1,465,289	1,465,289	-	16,422	-	16,422
2090	2,514,452,404	1,284,784	1,284,784	-	13,472	-	13,472
2091	2,686,118,484	1,129,503	1,129,503	-	11,081	-	11,081
2092	2,869,755,724	994,287	994,287	-	9,127	-	9,127
2093	3,066,166,996	875,195	875,195	-	7,516	-	7,516
2094	3,276,214,485	769,304	769,304	-	6,182	-	6,182
2095	3,500,822,713	674,518	674,518	-	5,071	-	5,071
2096	3,740,981,980	589,381	589,381	-	4,146	-	4,146
2097	3,997,752,222	512,888	512,888	-	3,376	-	3,376
2098	4,272,267,337	444,238	444,238	-	2,736	-	2,736
2099	4,565,740,064	382,821	382,821	-	2,206	-	2,206
2100	4,879,467,210	328,130	328,130	-	1,769	-	1,769
2101	5,214,835,324	279,680	279,680	-	1,411	-	1,411
2102	5,573,326,852	236,983	236,983	-	1,118	-	1,118
2103	5,956,526,740	199,526	199,526	-	881	-	881
2104	6,366,129,504	166,830	166,830	-	689	-	689
2105	6,803,946,741	138,455	138,455	-	535	-	535
2106	7,271,915,138	114,003	114,003	-	412	-	412
2107	7,772,105,040	93,078	93,078	-	315	-	315
2108	8,306,729,640	75,300	75,300	-	238	-	238
2109	8,878,154,791	60,335	60,335	-	179	-	179
2110	9,488,909,465	47,855	47,855	-	133	-	133
2111	10,141,696,962	37,549	37,549	-	97	-	97
2112	10,839,406,894	29,131	29,131	-	71	-	71
2113	11,585,127,972	22,336	22,336	-	51	-	51
2114	12,382,161,685	16,927	16,927	-	36	-	36
2115	13,234,036,909	12,669	12,669	-	25	-	25
2116	14,144,525,551	9,354	9,354	-	17	-	17
2117	15,117,659,239	6,804	6,804	-	12	-	12
2118	16,157,747,160	4,871	4,871	-	8	-	8
2119	17,269,395,129	3,424	3,424	-	5	-	5
2120	18,457,525,973	2,357	2,357	-	3	-	3
2121	19,727,401,324	-	-	-	-	-	-
				Totals	$ 3,595,499,958	$ -	$ 3,595,499,958


Projection of Plan Net Position With Annuity Reserve and Benefit Payments
End of Year
$ [thousands]
3,000,000
2,500,000
2,000,000
1,500,000
1,000,000
500,000
0
1 4 7 10 13 16 19 22 25 28 31 34 37 40 43 46 49 52 55 58 61 64 67 70 73 76 79 82 85 88 91 94 97 100
Year
Projected Plan Net Position
Projected Benefit Payments for Current Members

SECTION H

GLOSSARY OF TERMS

Glossary of Terms

Actuarial Accrued Liability (AAL)	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."
Actuarial Assumptions	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.
Accrued Service	Service credited under the system which was rendered before the date of the actuarial valuation.
Actuarial Equivalent	A single amount or series of amounts of equal actuarial value to another single amount or series of amounts, computed on the basis of appropriate actuarial assumptions.
Actuarial Cost Method	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.
Actuarial Gain (Loss)	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.
Actuarial Present Value (APV)	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.
Actuarial Valuation	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.
Actuarial Valuation Date	The date as of which an actuarial valuation is performed.
Actuarially Determined Contribution (ADC) or Annual Required Contribution (ARC)	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.
AFC	Average Final Compensation.

Glossary of Terms

Amortization Payment	The amortization payment is the periodic payment required to pay off an interest-discounted amount with payments of interest and principal.
Amortization Method	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).
Cost-of-Living Adjustments	Postemployment benefit changes intended to adjust benefit payments for the effects of inflation.
Cost-Sharing Multiple-Employer Defined Benefit Pension Plan (cost-sharing pension plan)	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.
Covered-Employee Payroll	The payroll of covered employees, which is typically only the pensionable pay and does not include pay above any pay cap.
Deferred Retirement Option Program (DROP)	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.
Deferred Inflows and Outflows	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.
Discount Rate	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: 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; and 2. 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

Other Postemployment Benefits (OPEB)	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.
PERSIA	Public Employees Retirement System Investment Act (Michigan PA 314).
PFRS	Police and Fire Retirement System
POA	The 8th Amended Plan for the Adjustment of the Debt of the City of Detroit.
Real Rate of Return	The real rate of return is the rate of return on an investment after adjustment to eliminate inflation.
Service Cost	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.
Total Pension Expense	The total pension expense is the sum of the following items that are recognized at the end of the employer's fiscal year: 1. Service Cost 2. Interest on the Total Pension Liability 3. Current-Period Benefit Changes 4. Employee Contributions (made negative for addition here) 5. Projected Earnings on Plan Investments (made negative for addition here) 6. Pension Plan Administrative Expense 7. Other Changes in Plan Fiduciary Net Position 8. Recognition of Outflow (Inflow) of Resources due to Liabilities 9. Recognition of Outflow (Inflow) of Resources due to Assets
Total Pension Liability (TPL)	The TPL is the portion of the actuarial present value of projected benefit payments that is attributed to past periods of member service.
Unfunded Actuarial Accrued Liability (UAAL)	The UAAL is the difference between actuarial accrued liability and valuation assets.
Valuation Assets	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.

APPENDIX

MICHIGAN PUBLIC ACT 202

State Reporting Assumptions for Fiscal Year 2021
Calculations as of June 30, 2020

The Protecting Local Government Retirement and Benefits Act, Public Act 202 of 2017 (PA 202), was put into law effective December 20, 2017. One outcome of the law is the requirement for the local unit of government to provide select reporting disclosures to the State. Sec. 5(1) of the Act provides the State treasurer with the authority to annually establish uniform actuarial assumptions for purposes of developing the requisite disclosures. Below you will find information which may be used to assist the local unit of government with required reporting.

Uniform Assumptions, as applicable to the measurement and the required disclosures under uniform assumptions are denoted below. Additional discussion of PA 202 and uniform assumptions published for Fiscal Year 2021 reporting may be found on the State website in the uniform assumptions memo dated October 22, 2020.

	PA 202	Assumptions Used for GASB	Uniform Assumptions Used for Fiscal Year 2021
Investment Rate of Return Discount Rate	**Maximum of 7.00%^**	7.15%	7.00%^
Salary Increase	Minimum of 3.50% or based on experience study within last 5 years	**N/A**	N/A
Mortality	**Version of Pub-2010 with future mortality improvement projected generationally using Scale MP-2019 or based on experience study within last 5 years**	A version of RP-2014. First used for the September 30, 2014 valuation.	Pub-2010, Amount Weighted, Safety tables with fully generational projection using Scale MP-2019. The corresponding Disabled Retiree and Employee tables are used for disability and pre-retirement mortality, respectively.
Amortization of the Unfunded Accrued Actuarial Liability: Period	**Maximum Period of 18 Years**	N/A	18 years
Method	**Closed Plans: Level Dollar Open Plans: Level Percent of Payroll or Level Dollar**	Other	Level Dollar

^ *A blended rate calculated using GASB Statement No. 68 methodology. For periods in which projected plan assets are sufficient to make projected benefit payments – maximum of 7.00%; for periods in which projected plan assets are NOT sufficient to make projected benefit payments – 2.20%.*

The calculations for PA 202 use a June 30, 2020 valuation date and a June 30, 2020 measurement date. The 7.15% Investment Rate of Return was used as the Long Term Expected Rate of Return for GASB disclosures with a measurement date of June 30, 2020. With exception of the assumptions and methods listed above, all other assumptions and methods are the same as those listed in the June 30, 2021 GASB report.

State Reporting for Fiscal Year 2021
Calculations as of June 30, 2020

The following information has been prepared to provide some of the information necessary to complete the pension reporting requirements for the State of Michigan's Local Government Retirement System Annual Report (Form 5572). The local unit of government is required to complete/develop all of the remaining reporting requirements necessary for Form 5572. Additional resources are available on the State website.

Line	Descriptive Information	
18	**Actuarial Assumptions**	
19	Actuarial assumed Rate of Investment Return	6.75%
20	Amortization method utilized for funding the system's unfunded actuarial accrued liability, if any	Other
21	Amortization period utilized for funding the system's unfunded actuarial accrued liability, if any	N/A
22	Is each division within the system closed to new employees? ~	yes
23	**Uniform Assumptions^**	
24	Enter retirement pension system's actuarial value of assets using uniform assumptions+	$ 2,417,248,140.00
25	Enter retirement pension system's actuarial accrued liabilities using uniform assumptions	$ 3,576,609,118.00
26	Funded ratio using uniform assumptions	67.6%
27	Actuarially Determined Contribution (ADC) using uniform assumptions	$ 115,255,091.00
28	All systems combined ADC/Governmental fund revenues	Auto*

^ *Information on lines 23-28 is based on the Uniform Assumptions used, listed on the prior page, as of the most recent valuation date, June 30, 2020.*

+ *The actuarial value of assets is equal to the market value of assets as of the June 30, 2020.*

* *Automatically calculated by State of Michigan Form 5572.*

~ *This Component II plan is closed to new employees. The Component I plan is open to new employees and its PA 202 information is in the Component I GASB No. 68 report.*