

The General Retirement System of the City of Detroit

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

June 30, 2019





November 8, 2019

Board of Trustees
The General Retirement System of the City of Detroit

Dear Board Members:

This report provides information required for the General 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 Statement No. 68 "Employer Reporting for Pension Plans." These calculations have been made on a basis that is consistent with our understanding of this Statement. This information is subject to the System's Auditor's review. Please let us know if the System's Auditor recommends any changes.

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. In particular, this is not a funding report and nothing in this report should be construed as a funding recommendation. This report may be provided to parties other than the System only in its entirety and only with the permission of the Board. GRS is not responsible for unauthorized use of this report.

This report is based upon information, furnished to us by System staff, concerning retirement and ancillary benefits, active members, deferred vested members, retirees and beneficiaries, and financial data. This report is based on the valuation date of June 30, 2018. The total pension liability was rolled-forward from the valuation date to the plan year ending June 30, 2019 using generally accepted actuarial principles. The asset information as of June 30, 2019 was provided by the System. This information was checked for internal consistency, but it was not audited by Gabriel, Roeder, Smith & Company. A description of the adjustments made to the data is incorporated in this report (either directly or by reference). GRS is not responsible for the accuracy of the data provided by the Retirement System. This report is based upon estimates of frozen accrued benefits. Future measurements based on final calculation of benefit amounts will differ.

At the direction of the System and approval of the System's Auditor, the long-term expected return on assets used to determine the discount rate is 7.38%, net of investment expenses, as of June 30, 2019, the same rate, net of investment expenses, as of June 30, 2018. We have reviewed this assumption based on the System's asset allocation and have determined it is reasonable for the purpose of the measurement being taken.

The benefit provisions reflected in this valuation for the development of the end of year Total Pension Liability (TPL) are those in effect for Component II as of the end of the plan year on June 30, 2019. We understand that Component I is a separate plan for GASB Nos. 67 and 68 purposes and will, therefore, be disclosed in a separate report.

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

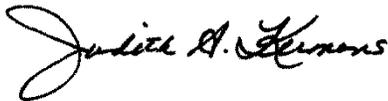
The signing individuals are independent of the plan sponsor.

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

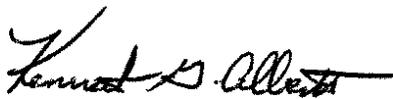
Respectfully submitted,



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SECTION A

EXECUTIVE SUMMARY

Executive Summary as of June 30, 2019

Actuarial Valuation Date	June 30, 2018
Measurement Date of the Net Pension Liability	June 30, 2019
Employer's Fiscal Year Ending Date (GASB No. 68 Reporting Date)	June 30, 2020

Membership

Number of	
- Retirees and Beneficiaries	11,684
- Inactive, Nonretired Members	3,236
- Active Members	3,018
- Total	17,938
Covered Payroll	\$ 149,373,313

Net Pension Liability

Total Pension Liability	\$ 2,733,602,681
Plan Fiduciary Net Position	1,798,906,827
Net Pension Liability	\$ 934,695,854
Plan Fiduciary Net Position as a Percentage of Total Pension Liability	65.81%
Net Pension Liability as a Percentage of Covered Payroll	625.74%

Development of the Single Discount Rate

Single Discount Rate	7.38%
Long-Term Expected Rate of Investment Return	7.38%
Long-Term Municipal Bond Rate*	3.13%
Last year ending June 30 in the 2020 to 2119 projection period for which projected benefit payments are fully funded	2119

Total Pension Expense	\$ 122,330,696
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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	103,828,623	44,828,858
Total	\$ 103,828,623	\$ 44,828,858

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

Discussion

Changes to the Actuarial Assumptions

There were no changes in actuarial assumptions. For purposes of determining the Total Pension Liability (TPL) as of June 30, 2019, we note the following differences from the assumptions used in the June 30, 2018 funding valuation:

- At the direction of the System and approval of the Systems' Auditor, the long-term expected return on assets was 7.38% net of investment expenses, as of June 30, 2019 (it was 6.75% net of investment and administrative expenses, in the June 30, 2018 funding valuation, as required by the Plan of Adjustment).
- The June 30, 2018 funding valuation included approximately \$9.9 million in liabilities to account for an anticipated excess ASF earnings transfer to Component I expected to occur in the future as a result of FY 2018 investment performance. We have discussed this additional liability with the Plan's auditor who indicated that the excess earnings transfer should not be included as a liability in the GASB 67/68 reports until it actually occurs. As such, the excess earnings transfer is not included as a liability in this report. Please see the funding valuation for more details.
- Administrative expenses are assumed to be shared 60% with Component II and 40% with Component I. This was reflected in our modeling, where appropriate.

All other actuarial assumptions were the same as those used in the June 30, 2018 actuarial valuation (the funding valuation). Assumptions were the same as those used in the June 30, 2018 GASB Statement Nos. 67 and 68 valuation.

Changes to the Benefit Provisions

There were no changes in benefit provisions during the year.

Data Approximations and Assumptions

A description of the data approximations and assumptions used in completing this report are included in the June 30, 2018 funding valuation report.

Administrative Expenses

We allocated 60% of the expenses to Component II and 40% to Component I, consistent with this year's allocation as shown in the assets.

Discussion

Development of Employer Proportionate Shares

As instructed, we have developed the proportionate employer shares as follows:

- General, DOT, DWSD, and Library have contribution rates assessed on separate relationships and are therefore accounted for separately under Paragraph 49 of GASB No. 68.
- The component units in the General Division were 1) General City; 2) Parking; and 3) Airport.
- Proportionate shares in the General Division were determined by prorating based on the Total Pension Liability.

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 General Retirement System of the City of Detroit subsequent to the measurement date of June 30, 2019.

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

Discussion

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.

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 and inflows of resources related to pensions.

GASB Statement Nos. 67 and 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 benefits provided by the plan;
- the type of employees and number of members covered by the pension plan;
- a description of the plan’s funding policy, which includes member and employer contribution requirements;
- the pension plan’s investment policies;
- the pension plan’s fiduciary net position and the net 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;
- significant assumptions and methods used to calculate the total pension liability;
- inputs to the discount rates; and
- certain information about mortality assumptions and the dates of experience studies.

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;
- a description of how fair value is determined;
- 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; and
- annual money-weighted rate of return.

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; and
- a comparison of the actual employer contributions to the actuarially determined contributions based on the plan's funding policy.

Timing of the Valuation

An actuarial valuation to determine the total pension liability is required to be performed at least every two years. The net pension liability and pension expense should be measured as of the pension plan's fiscal year end (measurement date) on a date that is within the employer's prior fiscal year. If the actuarial valuation used to determine the total pension liability is not calculated as of the measurement date, the total pension liability is required to be rolled forward from the actuarial valuation date to the measurement date.

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

Single Discount Rate

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

For the purpose of this valuation, the expected rate of return on pension plan investments is 7.38%; the municipal bond rate is 3.13% (based on the daily rate closest to but not later than the measurement date of the Fidelity "20-Year Municipal GO AA Index"); and the resulting Single Discount Rate is 7.38%.

The expected rate of return was provided by the Retirement System and approved by the System's auditor.

Discussion

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 (65.81% as of June 30, 2019). Unless otherwise indicated, with regard to any such measurements presented in this report:

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

Limitations of Project Scope

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

ASF Recoupments

The reported June 30, 2019 assets included a receivable, computed by the System's auditors, that accounts for future ASF recoupments. We understand this amount was originally determined as of June 30, 2015 and updated to June 30, 2019 in accordance with GAAP accounting.

Other Comments

During the year ending June 30, 2019 a \$23.6 million transfer was made from the Pension Accumulation Fund (PAF) to the Annuity Savings Fund (ASF). This transfer caused an increase in the TPL (and NPL) of an equal amount since liabilities for the ASF are equal to the reserve balance. We have detailed this amount separately in some cases, but have generally treated it like an experience gain/loss for purposes of the deferred inflows/outflows and the pension expense.

SECTION B

FINANCIAL STATEMENTS

This information is subject to the System's Auditor's review. Please let us know if the System's Auditor recommends any changes.

Statement of Fiduciary Net Position as of June 30, 2019

Assets

Cash and Cash Equivalents	\$	51,631,036
Receivables		115,241,526
Investments at Fair Value		1,643,478,100
Cash and Investments held as collateral for securities lending		81,947,607
Capital Assets - Net		<u>1,197,282</u>
Total Assets	\$	<u>1,893,495,551</u>

Liabilities

Accounts Payable	\$	<u>94,588,724</u>
Total Liabilities	\$	<u>94,588,724</u>

Net Position Restricted for Pensions	\$	<u>1,798,906,827</u>
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ASF Reserve	\$	120,248,768
Other Reserves		<u>1,678,658,059</u>
Plan Fiduciary Net Position	\$	<u>1,798,906,827</u>

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

Additions

Contributions	
Employer	\$ 67,900,000
Employee	-
Foundation Contribution	375,000
Total Contributions	<u>\$ 68,275,000</u>
Investment Income	
Investment Income	\$ 47,170,007
Net Investment Income	<u>\$ 47,170,007</u>
Other Income (Including ASF Interest)^	<u>\$ 6,882,567</u>
Total Additions	<u>\$ 122,327,574</u>

Deductions

Benefit Payments, including Refunds of Employee Contributions	\$ 248,790,015
Pension Plan Administrative Expense	3,023,943
Other (including ASF writeoffs and transfers to Comp I)	<u>12,230,431</u>
Total Deductions	<u>\$ 264,044,389</u>
Net Increase in Net Position	<u>\$ (141,716,815)</u>

Net Position Restricted for Pensions

Beginning of Year	<u>\$ 1,940,623,642</u>
End of Year	<u>\$ 1,798,906,827</u>

[^] Following discussions with the auditor, we understand that for purposes of determining the Pension Expense for GASB Statement No. 68, ASF Interest should be treated as Other Changes in Plan Fiduciary Net Position and recognized immediately.

Statement of Pension Expense Under GASB Statement No. 68 Fiscal Year Ended June 30, 2019*

A. Expense	General	DOT	DWSD	Library	Total
1. Service Cost	\$ -	\$ -	\$ -	\$ -	-
2. Interest on the Total Pension Liability	106,206,939	30,424,159	52,205,387	6,653,158	195,489,643
3. Current-Period Benefit Changes	-	-	-	-	-
4. Employee Contributions (made negative for addition here)	-	-	-	-	-
5. Projected Earnings on Plan Investments (made negative for addition here)	(76,295,004)	(14,006,433)	(39,926,919)	(6,019,745)	(136,248,101)
6. Pension Plan Administrative Expense	2,566,338	326,107	-	131,498	3,023,943
7. Other Changes in Plan Fiduciary Net Position	2,384,050	2,234,841	169,942	559,031	5,347,864
8. Recognition of Outflow (Inflow) of Resources due to Liabilities	10,605,505	(1,582,543)	4,924,609	(350,671)	13,596,900
9. Recognition of Outflow (Inflow) of Resources due to Assets	23,180,396	4,848,304	11,280,614	1,811,133	41,120,447
10. Total Pension Expense	\$ 68,648,224	\$ 22,244,435	\$ 28,653,633	\$ 2,784,404	\$ 122,330,696

**Totals may not add due to rounding.*

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

A. Outflows (Inflows) of Resources due to Liabilities	General	DOT	DWSB	Library	Total
1. Difference between expected and actual experience of the Total Pension Liability (gains) or losses	\$ 10,605,505	\$ (1,582,543)	\$ 4,924,609	\$ (350,671)	\$ 13,596,900
2. Assumption Changes (gains) or losses	\$ -	\$ -	\$ -	\$ -	\$ -
3. Recognition period for Liabilities: Average of the expected remaining service lives of all employees {in years}	1.0000	1.0000	1.0000	1.0000	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	\$ 10,605,505	\$ (1,582,543)	\$ 4,924,609	\$ (350,671)	\$ 13,596,900
5. Outflow (Inflow) of Resources to be recognized in the current pension expense for Assumption Changes	\$ -	\$ -	\$ -	\$ -	\$ -
6. Outflow (Inflow) of Resources to be recognized in the current pension expense due to Liabilities	\$ 10,605,505	\$ (1,582,543)	\$ 4,924,609	\$ (350,671)	\$ 13,596,900
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	\$ 49,965,808	\$ 8,381,262	\$ 26,848,067	\$ 3,882,957	\$ 89,078,094
2. Recognition period for Assets {in years}	5.0000	5.0000	5.0000	5.0000	5.0000
3. Outflow (Inflow) of Resources to be recognized in the current pension expense due to Assets	\$ 9,993,162	\$ 1,676,252	\$ 5,369,613	\$ 776,591	\$ 17,815,619
4. Deferred Outflow (Inflow) of Resources to be recognized in future pension expenses due to Assets	\$ 39,972,646	\$ 6,705,010	\$ 21,478,454	\$ 3,106,366	\$ 71,262,475

*Totals may not add due to rounding.

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

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	\$ 10,605,505	\$ -	\$ 10,605,505
2. Due to Assets	\$ 34,944,224	11,763,828	23,180,396
3. Total	\$ 45,549,729	\$ 11,763,828	\$ 33,785,901

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	\$ 10,605,505	\$ -	\$ 10,605,505
2. Assumption Changes	-	-	-
3. Net Difference between projected and actual earnings on pension plan investments	\$ 34,944,224	11,763,828	23,180,396
4. Total	\$ 45,549,729	\$ 11,763,828	\$ 33,785,901

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	\$ 58,885,631	26,679,565	32,206,066
4. Total	\$ 58,885,631	\$ 26,679,565	\$ 32,206,066

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 General Total
2020	\$ 17,142,319
2021	(1,770,666)
2022	6,841,253
2023	9,993,160
2024	-
Thereafter	-
Total	\$ 32,206,066

Recognition of Deferred Outflows and Inflows of Resources

Fiscal Year Ended June 30, 2019

General

Year Established	Initial Amount	Initial Recognition Period	Current Year Recognition	Remaining Recognition	Remaining Recognition Period
Deferred Outflow (Inflow) due to Differences Between Expected and Actual Experience on Liabilities					
2015	\$ 18,703,738	1.0000	\$ -	\$ -	0.0000
2016	(29,429,615)	1.0000	-	-	0.0000
2017	(23,006,975)	1.0000	-	-	0.0000
2018	3,041,504	1.0000	-	-	0.0000
2019	10,605,505	1.0000	10,605,505	-	0.0000
Total			\$ 10,605,505	\$ -	
Deferred Outflow (Inflow) due to Assumption Changes					
2015	\$ (55,704,947)	1.0000	\$ -	\$ -	0.0000
2016	49,169,719	1.0000	-	-	0.0000
2017	41,844,061	1.0000	-	-	0.0000
2018	(59,163,587)	1.0000	-	-	0.0000
2019	-	1.0000	-	-	0.0000
Total			\$ -	\$ -	
Deferred Outflow (Inflow) due to Differences Between Projected and Actual Earnings on Plan Investments					
2015	\$ 30,190,382	5.0000	\$ 6,038,078	\$ -	0.0000
2016	94,564,921	5.0000	18,912,984	18,912,985	1.0000
2017	(43,059,585)	5.0000	(8,611,917)	(17,223,834)	2.0000
2018	(15,759,553)	5.0000	(3,151,911)	(9,455,731)	3.0000
2019	49,965,808	5.0000	9,993,162	39,972,646	4.0000
Total			\$ 23,180,396	\$ 32,206,066	

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

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	\$ -	\$ 1,582,543	\$ (1,582,543)
2. Due to Assets	\$ 6,839,035	\$ 1,990,731	\$ 4,848,304
3. Total	\$ 6,839,035	\$ 3,573,274	\$ 3,265,761

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	\$ -	\$ 1,582,543	\$ (1,582,543)
2. Assumption Changes	-	-	-
3. Net Difference between projected and actual earnings on pension plan investments	\$ 6,839,035	\$ 1,990,731	\$ 4,848,304
4. Total	\$ 6,839,035	\$ 3,573,274	\$ 3,265,761

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	\$ 10,538,175	\$ 4,397,893	\$ 6,140,282
4. Total	\$ 10,538,175	\$ 4,397,893	\$ 6,140,282

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

Year Ending June 30	Net Deferred Outflows of Resources
2020	\$ 3,518,686
2021	(314,478)
2022	1,259,820
2023	1,676,254
2024	-
Thereafter	-
Total	\$ 6,140,282

Recognition of Deferred Outflows and Inflows of Resources

Fiscal Year Ended June 30, 2019

DOT

Year Established	Initial Amount	Initial Recognition Period	Current Year Recognition	Remaining Recognition	Remaining Recognition Period
Deferred Outflow (Inflow) due to Differences Between Expected and Actual Experience on Liabilities					
2015	\$ 12,036,135	1.0000	\$ -	\$ -	0.0000
2016	(3,435,546)	1.0000	-	-	0.0000
2017	(5,802,247)	1.0000	-	-	0.0000
2018	32,573,900	1.0000	-	-	0.0000
2019	(1,582,543)	1.0000	(1,582,543)	-	0.0000
Total			\$ (1,582,543)	\$ -	
Deferred Outflow (Inflow) due to Assumption Changes					
2015	\$ (14,340,139)	1.0000	\$ -	\$ -	0.0000
2016	12,849,218	1.0000	-	-	0.0000
2017	11,022,689	1.0000	-	-	0.0000
2018	(17,236,637)	1.0000	-	-	0.0000
2019	-	1.0000	-	-	0.0000
Total			\$ -	\$ -	
Deferred Outflow (Inflow) due to Differences Between Projected and Actual Earnings on Plan Investments					
2015	\$ 6,648,084	5.0000	\$ 1,329,616	\$ -	0.0000
2016	19,165,833	5.0000	3,833,167	3,833,165	1.0000
2017	(7,871,494)	5.0000	(1,574,299)	(3,148,597)	2.0000
2018	(2,082,160)	5.0000	(416,432)	(1,249,296)	3.0000
2019	8,381,262	5.0000	1,676,252	6,705,010	4.0000
Total			\$ 4,848,304	\$ 6,140,282	

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

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	\$ 4,924,609	\$ -	\$ 4,924,609
2. Due to Assets	\$ 16,662,417	\$ 5,381,803	\$ 11,280,614
3. Total	\$ 21,587,026	\$ 5,381,803	\$ 16,205,223

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	\$ 4,924,609	\$ -	\$ 4,924,609
2. Assumption Changes	-	-	-
3. Net Difference between projected and actual earnings on pension plan investments	\$ 16,662,417	\$ 5,381,803	\$ 11,280,614
4. Total	\$ 21,587,026	\$ 5,381,803	\$ 16,205,223

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	\$ 29,983,796	\$ 12,199,292	\$ 17,784,504
4. Total	\$ 29,983,796	\$ 12,199,292	\$ 17,784,504

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

Year Ending June 30	Net Deferred Outflows of Resources
2020	\$ 8,493,152
2021	(12,189)
2022	3,933,926
2023	5,369,615
2024	-
Thereafter	-
Total	\$ 17,784,504

Recognition of Deferred Outflows and Inflows of Resources

Fiscal Year Ended June 30, 2019

DWSD

Year Established	Initial Amount	Initial Recognition Period	Current Year Recognition	Remaining Recognition	Remaining Recognition Period
Deferred Outflow (Inflow) due to Differences Between Expected and Actual Experience on Liabilities					
2015	\$ (607,587)	1.0000	\$ -	\$ -	0.0000
2016	(7,203,304)	1.0000	-	-	0.0000
2017	3,370,105	1.0000	-	-	0.0000
2018	(456,059)	1.0000	-	-	0.0000
2019	4,924,609	1.0000	4,924,609	-	0.0000
Total			\$ 4,924,609	\$ -	
Deferred Outflow (Inflow) due to Assumption Changes					
2015	\$ (28,150,723)	1.0000	\$ -	\$ -	0.0000
2016	25,074,531	1.0000	-	-	0.0000
2017	21,554,914	1.0000	-	-	0.0000
2018	(30,363,241)	1.0000	-	-	0.0000
2019	-	1.0000	-	-	0.0000
Total			\$ -	\$ -	
Deferred Outflow (Inflow) due to Differences Between Projected and Actual Earnings on Plan Investments					
2015	\$ 13,937,310	5.0000	\$ 2,787,462	\$ -	0.0000
2016	42,526,710	5.0000	8,505,342	8,505,342	1.0000
2017	(19,730,574)	5.0000	(3,946,115)	(7,892,229)	2.0000
2018	(7,178,439)	5.0000	(1,435,688)	(4,307,063)	3.0000
2019	26,848,067	5.0000	5,369,613	21,478,454	4.0000
Total			\$ 11,280,614	\$ 17,784,504	

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

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	\$ -	\$ 350,671	\$ (350,671)
2. Due to Assets	\$ 2,509,800	698,667	1,811,133
3. Total	\$ 2,509,800	\$ 1,049,338	\$ 1,460,462

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	\$ -	\$ 350,671	\$ (350,671)
2. Assumption Changes	-	-	-
3. Net Difference between projected and actual earnings on pension plan investments	\$ 2,509,800	698,667	1,811,133
4. Total	\$ 2,509,800	\$ 1,049,338	\$ 1,460,462

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	\$ 4,421,021	1,552,108	2,868,913
4. Total	\$ 4,421,021	\$ 1,552,108	\$ 2,868,913

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

Year Ending June 30	Net Deferred Outflows of Resources
2020	\$ 1,392,579
2021	77,925
2022	621,816
2023	776,593
2024	-
Thereafter	-
Total	\$ 2,868,913

Recognition of Deferred Outflows and Inflows of Resources

Fiscal Year Ended June 30, 2019

Library

Year Established	Initial Amount	Initial Recognition Period	Current Year Recognition	Remaining Recognition	Remaining Recognition Period
Deferred Outflow (Inflow) due to Differences Between Expected and Actual Experience on Liabilities					
2015	\$ (5,487,755)	1.0000	\$ -	\$ -	0.0000
2016	(3,650,647)	1.0000	-	-	0.0000
2017	(2,069,263)	1.0000	-	-	0.0000
2018	(1,005,018)	1.0000	-	-	0.0000
2019	(350,671)	1.0000	(350,671)	-	0.0000
Total			\$ (350,671)	\$ -	
Deferred Outflow (Inflow) due to Assumption Changes					
2015	\$ (3,364,084)	1.0000	\$ -	\$ -	0.0000
2016	2,941,459	1.0000	-	-	0.0000
2017	2,504,293	1.0000	-	-	0.0000
2018	(3,511,050)	1.0000	-	-	0.0000
2019	-	1.0000	-	-	0.0000
Total			\$ -	\$ -	
Deferred Outflow (Inflow) due to Differences Between Projected and Actual Earnings on Plan Investments					
2015	\$ 2,092,765	5.0000	\$ 418,553	\$ -	0.0000
2016	6,573,279	5.0000	1,314,656	1,314,655	1.0000
2017	(2,719,454)	5.0000	(543,891)	(1,087,781)	2.0000
2018	(773,879)	5.0000	(154,776)	(464,327)	3.0000
2019	3,882,957	5.0000	776,591	3,106,366	4.0000
Total			\$ 1,811,133	\$ 2,868,913	

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

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	\$ 15,530,114	\$ 1,933,214	\$ 13,596,900
2. Due to Assets	\$ 60,955,476	19,835,029	41,120,447
3. Total	\$ 76,485,590	\$ 21,768,243	\$ 54,717,347

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	\$ 15,530,114	\$ 1,933,214	\$ 13,596,900
2. Assumption Changes	-	-	-
3. Net Difference between projected and actual earnings on pension plan investments	\$ 60,955,476	19,835,029	41,120,447
4. Total	\$ 76,485,590	\$ 21,768,243	\$ 54,717,347

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	\$ 103,828,623	44,828,858	58,999,765
4. Total	\$ 103,828,623	\$ 44,828,858	\$ 58,999,765

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

Year Ending June 30	Net Deferred Outflows of Resources
2020	\$ 30,546,736
2021	(2,019,408)
2022	12,656,815
2023	17,815,622
2024	-
Thereafter	-
Total	\$ 58,999,765

Schedule of Proportionate Employer Share for Year Ended June 30, 2019 General Subgroup*

Deferred Outflows of Resources								
TPL	Employer	Prop. Share	Net Pension Liability	Differences Between Expected and Actual Experience	Net Difference Between Projected and Actual Investment Earnings on Pension Plan Investments	Changes of Assum.	Changes in Proportion and Differences Between Employer Cont. and Share of Cont.	Total Deferred Outflows of Resources
\$ 1,462,522,347	General City	98.38%	\$ 478,999,135	\$ -	\$ 57,931,684	\$ -	\$ -	\$ 57,931,684
20,961,135	Parking	1.41%	6,865,102	-	830,287	-	-	830,287
3,121,871	Airport	0.21%	1,022,462	-	123,660	-	-	123,660
\$ 1,486,605,353	Total for All Employers	100.00%	\$ 486,886,699	\$ -	\$ 58,885,631	\$ -	\$ -	\$ 58,885,631

Deferred Inflows of Resources						Pension Expense		
Employer	Differences Between Expected and Actual Experience	Net Difference Between Projected and Actual Investment Earnings on Pension Plan Investments	Changes of Assum.	Changes in Proportion and Differences Between Employer Cont. and Share of Cont.	Total Deferred Inflows of Resources	Prop. Share of Plan Pension Expense	Net Amortization of Deferred Amounts from Changes in Proportion and Differences Between Employer Contributins and Proportionate	Total Employer Pension Expense
General City	\$ -	\$ 26,247,356	\$ -	\$ -	\$ 26,247,356	\$ 67,536,123	\$ 213,656	\$ 67,749,779
Parking	-	376,182	-	-	376,182	967,940	(166,406)	801,534
Airport	-	56,027	-	-	56,027	144,161	(47,250)	96,911
Total for All Employers	\$ -	\$ 26,679,565	\$ -	\$ -	\$ 26,679,565	\$ 68,648,224	\$ -	\$ 68,648,224

* Totals may not add due to rounding.

Schedule of Proportionate Employer Share for Year Ended June 30, 2019 General Subgroup*

Schedule of Deferred Inflows and Outflows								
Employer	Employer Allocation Percentage	2020	2021	2022	2023	2024	Thereafter	Total
General City	98.38%	\$ 16,864,613	\$ (1,741,981)	\$ 6,730,425	\$ 9,831,271	\$ -	\$ -	\$ 31,684,328
Parking	1.41%	241,707	(24,966)	96,462	140,904	-	-	454,106
Airport	0.21%	35,999	(3,718)	14,367	20,986	-	-	67,633
TOTAL	100.00%	\$ 17,142,319	\$ (1,770,666)	\$ 6,841,253	\$ 9,993,160	\$ -	\$ -	\$ 32,206,066

* Totals may not add due to rounding.

Determination of Employer Contribution Allocation for Year Ended June 30, 2019

Employer	General City	Parking	Airport	General Total	DOT	DWSD	Library	Total
Contributions Before General Breakdown				\$ 22,765,012	\$ 109,988	\$ 42,900,000	\$ 2,500,000	\$ 68,275,000
General Employer Allocation Percent	100.00%	0.00%	0.00%	100.00%	N/A	N/A	N/A	N/A
Times General Total	22,765,012	22,765,012	22,765,012	22,765,012	N/A	N/A	N/A	N/A
Contribution Allocation Dollar	\$ 22,765,012	\$ -	\$ -	\$ 22,765,012	\$ 109,988	\$ 42,900,000	\$ 2,500,000	\$ 68,275,000

We understand that the General contributions should be split between the General component units (General City, Parking, and Airport) according to the above schedule. Please let us know if a different allocation should be used.

SECTION C

REQUIRED SUPPLEMENTARY INFORMATION

Schedule of Changes in Net Pension Liability and Related Ratios Current Period

Fiscal Year Ended June 30, 2019*

A. Total Pension Liability	General	DOT	DWSD	Library	Total
1. Service Cost	\$ -	\$ -	\$ -	\$ -	\$ -
2. Interest on the Total Pension Liability	106,206,939	30,424,159	52,205,387	6,653,158	195,489,643
3. Changes of benefit terms	-	-	-	-	-
4. Difference between expected and actual experience of the Total Pension Liability	10,605,505	(1,582,543)	4,924,609	(350,671)	13,596,900
5. Changes of assumptions	0	0	0	0	0
6. Benefit payments, including refunds of employee contributions^	(138,650,989)	(36,531,401)	(66,156,352)	(7,451,273)	(248,790,015)
7. Net change in Total Pension Liability	\$ (21,838,545)	\$ (7,689,785)	\$ (9,026,356)	\$ (1,148,786)	\$ (39,703,472)
8. Total Pension Liability – Beginning	1,508,443,898	430,517,183	740,468,240	93,876,832	2,773,306,153
9. Total Pension Liability – Ending	\$ 1,486,605,353	\$ 422,827,398	\$ 731,441,884	\$ 92,728,046	\$ 2,733,602,681
B. Plan Fiduciary Net Position					
1. Contributions – employer	\$ 22,765,012	\$ 109,988	\$ 42,900,000	\$ 2,500,000	\$ 68,275,000
2. Contributions – employee	-	-	-	-	-
3. Net investment income	26,329,196	5,625,171	13,078,852	2,136,788	47,170,007
4. Benefit payments, including refunds of employee contributions	(138,650,989)	(36,531,401)	(66,156,352)	(7,451,273)	(248,790,015)
5. Pension Plan Administrative Expense	(2,566,338)	(326,107)	-	(131,498)	(3,023,943)
6. Other	(2,384,050)	(2,234,841)	(169,942)	(559,031)	(5,347,864)
7. Net change in Plan Fiduciary Net Position	\$ (94,507,169)	\$ (33,357,190)	\$ (10,347,442)	\$ (3,505,014)	\$ (141,716,815)
8. Plan Fiduciary Net Position – Beginning	1,094,225,823	209,280,239	552,728,316	84,389,264	1,940,623,642
9. Plan Fiduciary Net Position – Ending	\$ 999,718,654	\$ 175,923,049	\$ 542,380,874	\$ 80,884,250	\$ 1,798,906,827
C. Net Pension Liability	\$ 486,886,699	\$ 246,904,349	\$ 189,061,010	\$ 11,843,796	\$ 934,695,854
D. Plan Fiduciary Net Position as a percentage of the Total Pension Liability	67.25%	41.61%	74.15%	87.23%	65.81%
E. Covered-employee payroll	\$ 95,912,366	\$ 23,056,792	\$ 19,014,424	\$ 11,389,731	\$ 149,373,313
F. Net Pension Liability as a percentage of covered-employee payroll	507.64%	1070.85%	994.30%	103.99%	625.74%

*Totals may not add due to rounding.

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.

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,	2019	2018	2017	2016	2015	2014
Total Pension Liability						
Service Cost	\$ -	\$ -	\$ -	\$ -	\$ -	\$ 32,736,019
Interest on the Total Pension Liability	195,489,643	192,359,745	201,919,236	214,011,164	263,007,329	242,611,073
Benefit Changes	-	-	-	-	(731,824,895)	(113,311,571)
Difference between Expected and Actual Experience	13,596,900	34,154,327	(27,508,380)	(43,719,112)	24,644,530	-
Assumption Changes	-	(110,274,515)	76,925,957	90,034,927	(101,559,893)	(271,190,194)
Benefit Payments	(235,153,732)	(239,301,938)	(242,938,006)	(242,470,451)	(253,217,949)	(253,683,194)
Refunds*	(13,636,283)	(14,140,692)	(24,311,533)	(49,811,728)	(44,321,041)	(144,050,613)
Net Change in Total Pension Liability	(39,703,472)	(137,203,073)	(15,912,726)	(31,955,200)	(843,271,919)	(506,888,480)
Total Pension Liability - Beginning	2,773,306,153	2,910,509,226	2,926,421,952	2,958,377,152	3,801,649,071	4,308,537,551
Total Pension Liability - Ending (a)	\$ 2,733,602,681	\$ 2,773,306,153	\$ 2,910,509,226	\$ 2,926,421,952	\$ 2,958,377,152	\$ 3,801,649,071
Plan Fiduciary Net Position						
Employer Contributions	\$ 67,900,000	\$ 68,275,000	\$ 91,238,402	\$ 104,792,657	\$ 189,282,095	\$ 25,126,131
Employee Contributions	-	-	-	-	609,073	10,241,761
Pension Plan Net Investment Income	47,170,007	155,423,193	206,896,567	(7,865,094)	93,054,978	289,789,607
Benefit Payments	(235,153,732)	(239,301,938)	(242,938,006)	(242,470,451)	(253,217,949)	(253,683,194)
Refunds*	(13,636,283)	(14,140,692)	(24,311,533)	(49,811,728)	(44,321,041)	(144,050,613)
Pension Plan Administrative Expense	(3,023,943)	(3,313,418)	(6,021,837)	(3,742,618)	(7,556,822)	(11,237,767)
Other	(4,972,864)	6,952,522	8,324,075	1,360,330	138,219,998	-
Net Change in Plan Fiduciary Net Position	(141,716,815)	(26,105,333)	33,187,668	(197,736,904)	116,070,332	(83,814,075)
Plan Fiduciary Net Position - Beginning	1,940,623,642	1,966,728,975	1,933,541,307	2,131,278,211	2,015,207,879	2,099,021,954
Plan Fiduciary Net Position - Ending (b)	\$ 1,798,906,827	\$ 1,940,623,642	\$ 1,966,728,975	\$ 1,933,541,307	\$ 2,131,278,211	\$ 2,015,207,879
Net Pension Liability - Ending (a) - (b)	\$ 934,695,854	\$ 832,682,511	\$ 943,780,251	\$ 992,880,645	\$ 827,098,941	\$ 1,786,441,192
Plan Fiduciary Net Position as a Percentage of Total Pension Liability	65.81 %	69.98 %	67.57 %	66.07 %	72.04 %	53.01 %
Covered-Employee Payroll	\$ 149,373,313	\$ 141,454,717	\$ 143,882,722	\$ 200,722,197	\$ 203,507,079	\$ 213,291,083
Net Pension Liability as a Percentage of Covered-Employee Payroll	625.74 %	588.66 %	655.94 %	494.65 %	406.42 %	837.56 %
Notes to Schedule:	N/A	N/A	N/A	N/A	N/A	N/A

* For FY 2017, includes approximately \$2.9 million of adjusted loan balances that were treated as refunds of ASF contributions.

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 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	\$ 3,801,649,071	\$ 2,015,207,879	\$ 1,786,441,192	53.01%	\$ 213,291,083	837.56%
2015	2,958,377,152	2,131,278,211	827,098,941	72.04%	203,507,079	406.42%
2016	2,926,421,952	1,933,541,307	992,880,645	66.07%	200,722,197	494.65%
2017	2,910,509,226	1,966,728,975	943,780,251	67.57%	143,882,722	655.94%
2018	2,773,306,153	1,940,623,642	832,682,511	69.98%	141,454,717	588.66%
2019	2,733,602,681	1,798,906,827	934,695,854	65.81%	149,373,313	625.74%

* Covered payroll shown is the reported payroll on the actuarial valuation date (census date). Actual covered payroll paid during the year was unavailable.

Schedule of Contributions Multiyear

Ultimately 10 Fiscal Years will be Displayed

FY Ending June 30,	Actuarially Determined Contribution	Actual Contribution	Contribution Deficiency (Excess)	Covered Payroll*	Actual Contribution as a % of Covered Payroll
2014	\$80,627,791	\$ 25,126,131	\$55,501,660	\$213,291,083	11.78%
2015	N/A	189,282,095	N/A	203,507,079	93.01%
2016	N/A	104,792,657	N/A	200,722,197	52.21%
2017	N/A	91,238,402	N/A	143,882,722	63.41%
2018	N/A	68,275,000	N/A	141,454,717	48.27%
2019	N/A	68,275,000	N/A	149,373,313	45.71%

* Covered payroll shown is the reported payroll from the actuarial valuation date (census date). Actual covered payroll paid during the year was unavailable.

Notes to Schedule of Contributions

Contribution Requirement: Required contributions to the Plan through FY 2023 are provided in the POA. Certain agreements (as allowed for in the POA) have resulted in some of the contributions being accelerated. The schedule below details our understanding of the remaining contributions required by the POA.

Fiscal Year	Contribution Source								
	For DWSD Liabilities		For Other Liabilities						Total
	DWSD	Transfers	UTGO	State	DIA	Other	Transfers from DWSD		
2020	\$ 45.4	\$ (2.5)	\$ -	\$ -	\$ 0.4	\$ 2.5	\$ 2.5	\$ 48.3	
2021	45.4	(2.5)	-	-	0.4	2.5	2.5	48.3	
2022	45.4	(2.5)	-	-	0.4	2.5	2.5	48.3	
2023	45.4	(2.5)	-	-	0.4	2.5	2.5	48.3	

We have assumed the contributions outlined above as called for in the POA (with adjustments) will not change. An estimate of the probability of those payments being made was outside the scope of this project, not required by Actuarial Standards, and was not made.

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

Single Discount Rate

A Single Discount Rate of 7.38%, net of investment expenses, was used to measure the total pension liability as of June 30, 2019. This Single Discount Rate was based on the expected rate of return on pension plan investments of 7.38% as directed by the System and approved by the System's Auditor. The projection of cash flows used to determine this Single Discount Rate assumed that plan member contributions ceased as of June 30, 2014, and that employer contributions will be made at rates equal to those set by the final Plan of Adjustment through June 30, 2023 and contributions consistent with PERSIA and the intention to fully fund the System by 2053 as determined in the bankruptcy (POA). Based on these assumptions, the pension plan's fiduciary net position was projected to be available to make all projected future benefit payments of current plan members. Therefore, the long-term expected rate of return on pension plan investments was applied to all periods of projected benefit payments to determine the total pension liability.

Regarding the sensitivity of the net pension liability to changes in the Single Discount Rate, the following presents the plan's net pension liability, calculated using a Single Discount Rate of 7.38%, as well as what the plan's net pension liability would be if it were calculated using a Single Discount Rate that is one percent lower or one percent higher.

Sensitivity of Net Pension Liability to the Single Discount Rate Assumption

	1% Decrease 6.38%	Current Single Discount Rate Assumption 7.38%	1% Increase 8.38%
Total Pension Liability (TPL)	\$2,969,207,029	\$2,733,602,681	\$2,531,752,152
Net Position Restricted for Pensions	1,798,906,827	1,798,906,827	1,798,906,827
Net Pension Liability (NPL)	\$1,170,300,202	\$ 934,695,854	\$ 732,845,325

Users of this report should be aware that, in the actuary's judgement, a discount rate of 8.38% would not be a reasonable assumption for funding purposes.

Summary of Population Statistics

Inactive Plan Members or Beneficiaries Currently Receiving Benefits	11,684
Inactive Plan Members Entitled to But Not Yet Receiving Benefits	3,236
Active Plan Members	<u>3,018</u>
Total Plan Members	17,938

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

Additional Note

Potential future asset transfers from this Plan to Component I for payment of Transition Costs were not included in this calculation.

SECTION E

SUMMARY OF BENEFITS

Summary of Benefit Provisions Evaluated

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 General Retirement System as it existed on June 30, 2014. Frozen benefits are further reduced by 4.5% and all future Cost-of-Living Adjustments (“COLAs”) were eliminated. Benefits resulting from the Annuity Savings Fund and benefits paid from the Annuity Reserve Fund were subject to a separate reduction described as a “Claw-back.” Details of the claw-back provision are complicated and can be found in the Eighth Amended Plan of Adjustment. The benefits evaluated in this report are the frozen reduced benefits after the claw-back. 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 does not have legal standing 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 Pension

Eligibility - Any age (minimum age 55 for non-EMS members hired after 1995) with 30 years of service (25 for EMS members), or age 60 with 10 years of service, or age 65 with 8 years of service.

Annual Amount - EMS Members: Sum of a) a basic pension of \$12 for each of the first 10 years of service, plus b) a pension equal to 2.0% of AFC multiplied by years of service. Maximum benefit is 90% of AFC.

Other Members: Sum of a) a basic pension of \$12 for each of the first 10 years of service, plus b) a pension equal to the first 10 years of service multiplied by 1.6% of AFC, plus 1.8% of AFC for each year of service greater than 10 years up to 20 years, plus 2.0% of AFC for each year of service greater than 20 years up to 25 years, plus 2.2% of AFC for each year of service greater than 25 years. Future benefit accruals for certain active members (depending on bargaining unit) were reduced to 1.5% of final average compensation per year of service.

Type of Average Final Compensation (AFC) - Highest 3 consecutive years out of the last 10. Pension benefits will not be diminished if compensation is reduced because of a fiscal emergency. Effective July 1, 1999, in computing the AFC, a member shall have the option of adding the value of 25% of unused accrued sick leave to the earnings used in computing the AFC. Longevity is added to AFC in accordance with the following schedule: \$150 after 5 years, \$300 after 10 years, \$450 after 15 years, \$600 after 20 years, and \$750 after 25 years.

Early Retirement

Eligibility - Any age with 25 or more years of service (min. age 55 for members hired after 1995).

Annual Amount - Same as regular retirement but actuarially reduced.

Summary of Benefit Provisions Evaluated (Continued)

Deferred Retirement (Vested Benefit)

Eligibility - Hired prior to 7-1-80: Age 40 with 8 years of service. Hired on or after 7-1-80: Any age with 10 years of service.

Benefit Commencement - APTE hired prior to July 1, 1988: Benefit begins at the age the member would have become eligible for regular retirement if service had continued. **SAAA, Non-Union and lawyers hired prior to June 30, 1986:** Benefit begins at the age the member would have become eligible for regular retirement. **Others:** Benefits based on service rendered by June 30, 1986 begin at the age the member would have become eligible for regular retirement. Benefits based on service rendered after July 1, 1986 begin at age 62.

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

Duty Disability Retirement

Eligibility - Service related disability before eligibility for service retirement prior to July 1, 2014. No service requirement.

Annual Amount - An annuity which is the actuarial equivalent of the accumulated contributions at date of disability plus a pension of two-thirds of average final compensation at time of disability. The maximum annual pension is \$5,700 (\$9,000 for EMS). At the earliest of when the member would have accrued 30 years of service credit (25 for EMS) or age 60, the annuity is recomputed assuming contributions would have continued at a salary level equal to final compensation. The pension is recomputed with additional service credit granted from the date of disability to age 60 (or 30 years of service credit) or June 30, 2014, whichever is earlier. Benefits payable prior to conversion/re-computation, if any, were assumed to be paid outside the trust.

Non-Duty Disability Retirement

Eligibility - Disability from any cause before age 60 with 10 or more years of service prior to July 1, 2014.

Annual Amount - Computed in the same manner as a regular retirement benefit. Maximum annual pension to age 60 is \$6,000. Benefit is recomputed at age 60 with no maximum. Benefits payable prior to age 60, if any, were assumed to be paid from outside the trust.

Duty Death Before Retirement

Eligibility - Death from service related causes. No age or service requirements.

Annual Amount - One-third of final compensation as of June 30, 2014 to the surviving spouse for life or until remarriage, plus an equal share of 1/4 of final compensation to each unmarried child under age 18. If there is no eligible spouse, eligible children each receive 1/4 of final compensation; if there are more than 2 such children, each child shares an equal part of 1/2 of final compensation. Maximum total amount for spouse and children is \$9,000 annually. If there is no eligible spouse or children, dependent parents each receive 1/6 of deceased's final compensation, to a total maximum of \$600 annually.

Summary of Benefit Provisions Evaluated (Concluded)

Non-Duty Death Before Retirement

Eligibility - Death-in-service at any age with 15 years of service; or after age 60 with 10 years of service; or after age 65 with 8 years of service.

Annual Amount - To Surviving Spouse: Computed as a regular retirement benefit but reduced in accordance with a 100% joint and survivor election for members with 20 or more years of service. For members with 15 years of service but less than 20, benefit is reduced in accordance with a 50% joint and survivor election. To Dependent Children if no Surviving Spouse: \$9,000 payable to age 19 of the youngest child or for life if child is physically or mentally impaired for members with 20 or more years of service (\$6,000 if less than 20 years of service).

Post-Retirement Cost-of-Living Adjustments

Benefit is increased annually by 2.25% of the **original** pension amount at retirement. Post-retirement cost-of-living increases were eliminated on future accruals for certain active members (depending on bargaining unit).

Member Contributions

Members had the option of choosing one of four contribution amounts: (1) 0%; (2) 3.0% of compensation up to the Social Security wage base, plus 5.0% of compensation in excess of the Social Security wage base; (3) 5.0% of total compensation; or (4) 7.0% of total compensation. Member contributions can be paid as a lump sum or annuitized at retirement to provide an annuity in addition to the pension (which is not affected by the level of member contributions).

SECTION F

ACTUARIAL COST METHOD AND ACTUARIAL ASSUMPTIONS

Summary of Assumptions and Methods Used for GASB Actuarial Valuations Adopted by Board of Trustees

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

Economic Assumptions

The investment return rate used in making the valuation was 7.38% per year, compounded annually (net after investment expenses) as of June 30, 2019. 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 assumptions, we assumed price inflation of 2.50% per year.

Non-Economic Assumptions

The mortality table used to measure retired life mortality was 100% of the RP-2014 Blue Collar Annuitant Table set-forward 1 year for males and 100% of the RP-2014 Blue Collar Annuitant Table set-forward 1 year for females. Tables were extended below age 50 with a cubic spline to the published Juvenile rates. Pre-retirement mortality is based on the corresponding Employee tables with corresponding set forward. 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). 75% of all deaths-in-service are assumed to be non-duty related. This table was first used as of June 30, 2014. For disabled members, the same tables are used. The rationale for the mortality assumption is based on the 2008-2013 Mortality Experience Study issued February 4, 2015.

The probabilities of retirement for members eligible to retire are shown on pages 34 and 35. These probabilities were revised for the June 30, 2008 valuation. The rationale is based on the 2002-2007 Experience Study.

The probabilities of separation from service (including *disability*) are shown for sample ages on page 36. These probabilities were revised for the June 30, 2008 valuation. The rationale is based on the 2002-2007 Experience Study.

**Single Life Retirement Values
Based on RP-2014 Blue Collar
100% of Male Rates Set-Forward 1 Year
100% of Female Rates Set-Forward 1 Year**

Sample Attained Ages in 2018	Future Life Expectancy (years)	
	Men	Women
45	38.62	41.96
50	33.66	36.91
55	28.90	32.01
60	24.35	27.26
65	20.05	22.69
70	16.07	18.38
75	12.45	14.42
80	9.26	10.91

Rationale for assumption is based upon a 2008 to 2013 study of mortality experience dated February 4, 2015.

Probabilities of Age/Service Retirement for Members Eligible to Retire

Retirement Ages	Percent of Eligible Active Members Retiring Within Next Year With Unreduced Benefits		
	EMS	D.O.T.	Others
45	25%		
46	25%		
47	25%		
48	22%		
49	20%		
50	18%	55%	50%
51	15%	50%	50%
52	15%	50%	45%
53	15%	50%	45%
54	15%	55%	40%
55	15%	50%	30%
56	15%	50%	30%
57	15%	50%	30%
58	15%	50%	30%
59	15%	55%	40%
60	40%	40%	25%
61	30%	30%	25%
62	30%	30%	25%
63	30%	30%	25%
64	30%	30%	25%
65	30%	30%	35%
66	30%	30%	30%
67	30%	30%	25%
68	30%	50%	25%
69	30%	50%	25%
70	100%	100%	20%
71			20%
72			20%
73			20%
74			20%
75			20%
76			20%
77			20%
78			20%
79			20%
80			100%
Ref	537	1648	1647

Rationale for assumption is 2002 to 2007 Experience Study. Additional retirement rates for Component I (Hybrid Plan) eligibility are not reflected in this valuation due to materiality.

Probabilities of Early Retirement for Members Eligible for Early Retirement

Retirement Ages	Percent of Eligible Active Members Retiring Within Next Year With Reduced Benefits
55	7%
56	8%
57	9%
58	10%
59	12%
60	12%
61	12%
62	12%
63	12%
64	12%
Ref	1649

Rationale for assumption is based upon a 2002 to 2007 Experience Study.

Sample Rates of Separation from Active Employment Before Retirement

Sample Ages	Years of Service	% of Active Members Separating Within Next Year			
		Withdrawal			
		EMS	D.O.T.	Others	
Men	Women				
ALL	0	11.00%	18.00%	18.00%	20.00%
	1	10.00%	16.00%	15.00%	16.00%
	2	8.00%	14.00%	13.00%	14.00%
	3	8.00%	11.00%	11.00%	12.00%
	4	7.00%	9.00%	10.00%	10.00%
25	5 & Over	6.70%	8.00%	7.60%	7.60%
30		5.90%	7.60%	7.22%	7.22%
35		5.20%	5.56%	5.28%	5.28%
40		4.40%	4.26%	4.05%	4.05%
45		3.40%	3.69%	3.51%	3.51%
50		2.40%	3.50%	3.33%	3.33%
55		2.00%	3.50%	3.33%	3.33%
60		0.00%	3.50%	3.33%	3.33%
Ref		338 1068	143 212	584 212 x 0.95	188 212 x 0.95

Sample Ages	% of Active Members Becoming Disabled Within Next Year			
	D.O.T.		Others	
	Ordinary	Duty	Ordinary	Duty
25	0.02%	0.03%	0.01%	0.25%
30	0.05%	0.08%	0.04%	0.29%
35	0.14%	0.21%	0.11%	0.34%
40	0.27%	0.42%	0.21%	0.39%
45	0.51%	0.79%	0.40%	0.45%
50	0.66%	1.03%	0.51%	0.52%
55	0.76%	1.18%	0.59%	0.60%
60	0.86%	1.34%	0.67%	0.70%
Ref	23 x 0.45	23 x 0.70	23 x 0.35	423 x 0.90

Rationale for assumption is based upon a 2002 to 2007 Experience Study.

Miscellaneous and Technical Assumptions

Benefit Service	Exact Fractional service is used to determine the amount of benefit payable.
Decrement Operation	Disability and mortality decrements do not operate during the first 5 years of service. Disability and withdrawal also do not operate during retirement eligibility.
Decrement Timing	Decrements of all types are assumed to occur mid-year.
Eligibility Testing	Eligibility for benefits is determined based upon the age nearest birthday and rounded service on the date the decrement is assumed to occur.
Forfeitures	None.
Marriage Assumption	100% of males and 100% of females are assumed to be married for purposes of death-in-service benefits. Male spouses are assumed to be three years older than female spouses for active member valuation purposes.
Normal Form of Benefit	Straight life is the normal form of benefit. The Board adopted assumptions for Actuarial Equivalence to be an 80%/20% unisex blend of RP-2014 mortality (Male/Female) with Blue Collar Adjustment, set ahead 1 year for males and females, projected 11 years with MP-2014, an interest rate of 6.75, and no COLA for optional forms of payment and early retirement reduction. Assumptions for annuitizing member contributions are the same except for using a 60%/40% unisex blend and a 5.25% assumed rate of interest. Prior to that, actuarial equivalent factors were based on 7.5% interest and 1984 Group Annuity Mortality table.
Service Credit Accruals	Service accruals stop as of June 30, 2014 for measurement of Component II liabilities. However, future service in Component I may be used to satisfy benefit eligibility requirement in Component II. Members who became duty disabled prior to June 30, 2014 are assumed to get projected service from date of disability to conversion date. Members who become disabled after June 30, 2014 are assumed to get their frozen accrued benefit as of June 30, 2014 at date of conversion.
Administrative Expenses	3.00% of Component I payroll. 60% was allocated to Component II and 40% to Component I.
Sick Leave	Sick leave banks as of June 30, 2014 were included in the 2014 data file provided by the System.
Member Contributions	Member contributions to this Component II plan are assumed to have ceased with the bankruptcy.
Pop-Up Benefits	For current retirees with a pop-up benefit, the value of the pop-up was estimated by valuing a non-pop-up option and increasing the associated liabilities by 2%.

Rationale for assumption is based upon a 2002 to 2007 Experience Study, modified as necessary for changes in data or administration.

SECTION G

CALCULATION OF THE SINGLE DISCOUNT RATE

Calculation of the Single Discount Rate at End of Year

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

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

For the purpose of this valuation, the expected rate of return on pension plan investments is 7.38%; the municipal bond rate is 3.13%; and the resulting Single Discount Rate is 7.38% as of June 30, 2019.

The tables in this section provide background for the development of the Single Discount Rate.

The **Projection of Contributions** table shows the development of expected contributions in future years. Normal Cost contributions for future hires are not included (nor are their liabilities). For purposes of determining the discount rate as of June 30, 2019, the employer contributions for the 10-year period ending June 30, 2023 were set by the 8th Amended Plan of Adjustment (POA), as adjusted by subsequent agreements. Subsequent employer contributions were determined by a closed 30-year level principle amortization of any unfunded actuarial accrued liability using 7.38% interest, net of investment expenses, consistent with the 100% funded target by 2053 in the POA and State Law.

Rates of Return: Note that these projections are specifically used to determine the SDR and should not be interpreted as a funding recommendation. The 7.38% rate of return was before administrative expenses. Therefore, the projections assumed that any administrative expenses incurred by the plan will directly increase employer contributions beginning with FY 2024. The rate is net of investment expenses.

Administrative Expenses: For purposes of the projection using a 7.38% rate of return, administrative expenses were assumed to be related to payroll. Payroll was increased by an 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.

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.

Calculation of the Single Discount Rate at End of Year

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 (if any) and shows the equivalent total at the SDR. For purposes of determining the discount rate as of June 30, 2019, the benefit payments reflect the plan provisions in force as of June 30, 2019.

Single Discount Rate Development Projection of Contributions End of Year

Fiscal Year Ending June 30,	Projected Contributions from Current Employees	Projected Service Cost	Administrative Expense Contributions	Projected UAL Contributions	Projected Total Contributions
2020	\$ -	\$ -	\$ 4,003,491	\$ 44,271,509	\$ 48,275,000
2021	-	-	3,688,290	44,586,710	48,275,000
2022	-	-	3,442,571	44,832,429	48,275,000
2023	-	-	3,254,127	45,020,873	48,275,000
2024	-	-	3,099,688	107,116,448	110,216,136
2025	-	-	2,956,312	104,656,836	107,613,148
2026	-	-	2,825,200	102,197,224	105,022,424
2027	-	-	2,682,735	99,737,611	102,420,346
2028	-	-	2,528,771	97,277,999	99,806,770
2029	-	-	2,377,390	94,818,387	97,195,777
2030	-	-	2,236,895	92,358,774	94,595,669
2031	-	-	2,103,031	89,899,162	92,002,193
2032	-	-	1,974,356	87,439,550	89,413,906
2033	-	-	1,850,063	84,979,938	86,830,001
2034	-	-	1,733,748	82,520,325	84,254,073
2035	-	-	1,625,976	80,060,713	81,686,689
2036	-	-	1,524,318	77,601,101	79,125,419
2037	-	-	1,426,282	75,141,489	76,567,771
2038	-	-	1,333,444	72,681,876	74,015,320
2039	-	-	1,246,058	70,222,264	71,468,322
2040	-	-	1,162,953	67,762,652	68,925,605
2041	-	-	1,084,383	65,303,039	66,387,422
2042	-	-	1,008,841	62,843,427	63,852,268
2043	-	-	936,579	60,383,815	61,320,394
2044	-	-	866,984	57,924,203	58,791,187
2045	-	-	798,070	55,464,590	56,262,660
2046	-	-	729,851	53,004,978	53,734,829
2047	-	-	661,273	50,545,366	51,206,639
2048	-	-	589,765	48,085,753	48,675,518
2049	-	-	518,372	45,626,141	46,144,513
2050	-	-	451,213	43,166,529	43,617,742
2051	-	-	387,805	40,706,917	41,094,722
2052	-	-	328,668	38,247,304	38,575,972
2053	-	-	275,206	35,787,692	36,062,898
2054	-	-	228,115	-	228,115
2055	-	-	187,180	-	187,180
2056	-	-	151,718	-	151,718
2057	-	-	121,361	-	121,361
2058	-	-	96,002	-	96,002
2059	-	-	75,057	-	75,057
2060	-	-	57,734	-	57,734
2061	-	-	43,143	-	43,143
2062	-	-	31,272	-	31,272
2063	-	-	22,185	-	22,185
2064	-	-	15,584	-	15,584
2065	-	-	10,930	-	10,930
2066	-	-	7,657	-	7,657
2067	-	-	5,346	-	5,346
2068	-	-	3,726	-	3,726
2069	-	-	2,587	-	2,587

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	Projected Total Contributions	Projected Benefit Payments	Projected ASF Refund	Projected Administrative Expenses	Projected Investment Earnings at 7.38% (5.25% for ASF)	Projected Ending Plan Net Position
	(a)	(b)	(c)	(d)	(e)	(f)	(g)=(a)+(b)-(c)-(d)-(e)+(f)
2020	\$ 1,798,906,827	\$ 48,275,000	\$ 246,539,972	\$ 15,364,239	\$ 4,003,491	\$ 122,469,013	\$ 1,703,743,138
2021	1,703,743,138	48,275,000	245,085,260	15,364,239	3,688,290	115,711,351	1,603,591,701
2022	1,603,591,701	48,275,000	242,863,029	15,364,239	3,442,571	108,621,459	1,498,818,321
2023	1,498,818,321	48,275,000	240,187,961	15,364,239	3,254,127	101,215,925	1,389,502,920
2024	1,389,502,920	110,216,136	237,493,538	15,364,239	3,099,688	95,731,311	1,339,492,902
2025	1,339,492,902	107,613,148	234,701,767	15,364,239	2,956,312	92,299,594	1,286,383,327
2026	1,286,383,327	105,022,424	231,605,211	15,364,239	2,825,200	88,663,143	1,230,274,244
2027	1,230,274,244	102,420,346	227,934,289	15,364,239	2,682,735	84,839,793	1,171,553,120
2028	1,171,553,120	99,806,770	223,716,795	15,364,239	2,528,771	80,857,847	1,110,607,933
2029	1,110,607,933	97,195,777	218,946,994	15,364,239	2,377,390	76,746,901	1,047,861,989
2030	1,047,861,989	94,595,669	213,996,253	-	2,236,895	72,923,681	999,148,191
2031	999,148,191	92,002,193	208,749,796	-	2,103,031	69,429,607	949,727,165
2032	949,727,165	89,413,906	203,293,223	-	1,974,356	65,890,955	899,764,446
2033	899,764,446	86,830,001	197,494,767	-	1,850,063	62,324,717	849,574,334
2034	849,574,334	84,254,073	191,277,716	-	1,733,748	58,756,868	799,573,812
2035	799,573,812	81,686,689	184,593,749	-	1,625,976	55,219,934	750,260,710
2036	750,260,710	79,125,419	177,678,054	-	1,524,318	51,742,130	701,925,887
2037	701,925,887	76,567,771	170,493,233	-	1,426,282	48,346,277	654,920,419
2038	654,920,419	74,015,320	163,189,239	-	1,333,444	45,052,849	609,465,904
2039	609,465,904	71,468,322	155,625,146	-	1,246,058	41,883,309	565,946,331
2040	565,946,331	68,925,605	147,897,980	-	1,162,953	38,862,477	524,673,480
2041	524,673,480	66,387,422	140,090,346	-	1,084,383	36,010,370	485,896,544
2042	485,896,544	63,852,268	132,210,219	-	1,008,841	33,345,089	449,874,842
2043	449,874,842	61,320,394	124,375,340	-	936,579	30,881,505	416,764,822
2044	416,764,822	58,791,187	116,587,330	-	866,984	28,631,104	386,732,797
2045	386,732,797	56,262,660	108,832,730	-	798,070	26,606,647	359,971,305
2046	359,971,305	53,734,829	101,181,949	-	729,851	24,819,794	336,614,128
2047	336,614,128	51,206,639	93,721,443	-	661,273	23,277,283	316,715,334
2048	316,715,334	48,675,518	86,472,114	-	589,765	21,982,347	300,311,320
2049	300,311,320	46,144,513	79,484,629	-	518,372	20,935,835	287,388,666
2050	287,388,666	43,617,742	72,785,502	-	451,213	20,135,797	277,905,490
2051	277,905,490	41,094,722	66,396,146	-	387,805	19,578,365	271,794,625
2052	271,794,625	38,575,972	60,334,265	-	328,668	19,257,941	268,965,606
2053	268,965,606	36,062,898	54,615,294	-	275,206	19,167,289	269,305,292
2054	269,305,292	228,115	49,249,561	-	228,115	18,089,768	238,145,499
2055	238,145,499	187,180	44,241,127	-	187,180	15,971,697	209,876,069
2056	209,876,069	151,718	39,591,819	-	151,718	14,053,919	184,338,169
2057	184,338,169	121,361	35,297,829	-	121,361	12,324,850	161,365,190
2058	161,365,190	96,002	31,351,966	-	96,002	10,772,455	140,785,680
2059	140,785,680	75,057	27,744,484	-	75,057	9,384,434	122,425,629
2060	122,425,629	57,734	24,462,814	-	57,734	8,148,400	106,111,215
2061	106,111,215	43,143	21,491,868	-	43,143	7,052,073	91,671,421
2062	91,671,421	31,272	18,814,849	-	31,272	6,083,440	78,940,012
2063	78,940,012	22,185	16,413,760	-	22,185	5,230,885	67,757,137
2064	67,757,137	15,584	14,269,798	-	15,584	4,483,293	57,970,633
2065	57,970,633	10,930	12,363,723	-	10,930	3,830,132	49,437,041
2066	49,437,041	7,657	10,676,129	-	7,657	3,261,516	42,022,429
2067	42,022,429	5,346	9,187,852	-	5,346	2,768,258	35,602,834
2068	35,602,834	3,726	7,880,365	-	3,726	2,341,879	30,064,349
2069	30,064,349	2,587	6,736,049	-	2,587	1,974,613	25,302,913

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	Projected Beginning Plan Net Position	Projected Total Contributions	Projected Benefit Payments	Projected ASF Refund	Projected Administrative Expenses	Projected Investment Earnings at 7.38% (5.25% for ASF)	Projected Ending Plan Net Position
Ending June 30,	(a)	(b)	(c)	(d)	(e)	(f)	(g)=(a)+(b)-(c)-(d)-(e)+(f)
2070	\$ 25,302,913	\$ 1,784	\$ 5,738,341	\$ -	\$ 1,784	\$ 1,659,379	\$ 21,223,951
2071	21,223,951	1,224	4,871,735	-	1,224	1,389,760	17,741,977
2072	17,741,977	837	4,121,776	-	837	1,159,971	14,780,172
2073	14,780,172	567	3,475,134	-	567	964,827	12,269,865
2074	12,269,865	381	2,919,623	-	381	799,700	10,149,941
2075	10,149,941	253	2,444,143	-	253	660,482	8,366,280
2076	8,366,280	166	2,038,630	-	166	543,545	6,871,195
2077	6,871,195	108	1,694,029	-	108	445,697	5,622,863
2078	5,622,863	65	1,402,237	-	65	364,146	4,584,772
2079	4,584,772	31	1,156,089	-	31	296,456	3,725,139
2080	3,725,139	11	949,277	-	11	240,510	3,016,372
2081	3,016,372	2	776,261	-	2	194,474	2,434,586
2082	2,434,586	-	632,201	-	-	156,759	1,959,144
2083	1,959,144	-	512,868	-	-	125,997	1,572,274
2084	1,572,274	-	414,528	-	-	101,010	1,258,755
2085	1,258,755	-	333,892	-	-	80,795	1,005,658
2086	1,005,658	-	268,083	-	-	64,501	802,077
2087	802,077	-	214,606	-	-	51,415	638,887
2088	638,887	-	171,329	-	-	40,940	508,497
2089	508,497	-	136,450	-	-	32,582	404,629
2090	404,629	-	108,450	-	-	25,931	322,110
2091	322,110	-	86,051	-	-	20,653	256,712
2092	256,712	-	68,196	-	-	16,474	204,990
2093	204,990	-	54,016	-	-	13,171	164,145
2094	164,145	-	42,794	-	-	10,563	131,914
2095	131,914	-	33,947	-	-	8,505	106,471
2096	106,471	-	27,003	-	-	6,879	86,347
2097	86,347	-	21,570	-	-	5,591	70,368
2098	70,368	-	17,328	-	-	4,565	57,604
2099	57,604	-	14,020	-	-	3,743	47,327
2100	47,327	-	11,438	-	-	3,078	38,968
2101	38,968	-	9,411	-	-	2,535	32,092
2102	32,092	-	7,805	-	-	2,085	26,372
2103	26,372	-	6,517	-	-	1,710	21,565
2104	21,565	-	5,461	-	-	1,394	17,497
2105	17,497	-	4,575	-	-	1,125	14,047
2106	14,047	-	3,816	-	-	898	11,129
2107	11,129	-	3,157	-	-	707	8,679
2108	8,679	-	2,582	-	-	547	6,644
2109	6,644	-	2,080	-	-	415	4,979
2110	4,979	-	1,644	-	-	308	3,643
2111	3,643	-	1,272	-	-	223	2,593
2112	2,593	-	962	-	-	157	1,788
2113	1,788	-	708	-	-	106	1,186
2114	1,186	-	507	-	-	69	749
2115	749	-	351	-	-	43	441
2116	441	-	234	-	-	24	230
2117	230	-	151	-	-	12	91
2118	91	-	94	-	-	3	-
2119	-	-	-	-	-	0	0

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

(Excluding ASF)

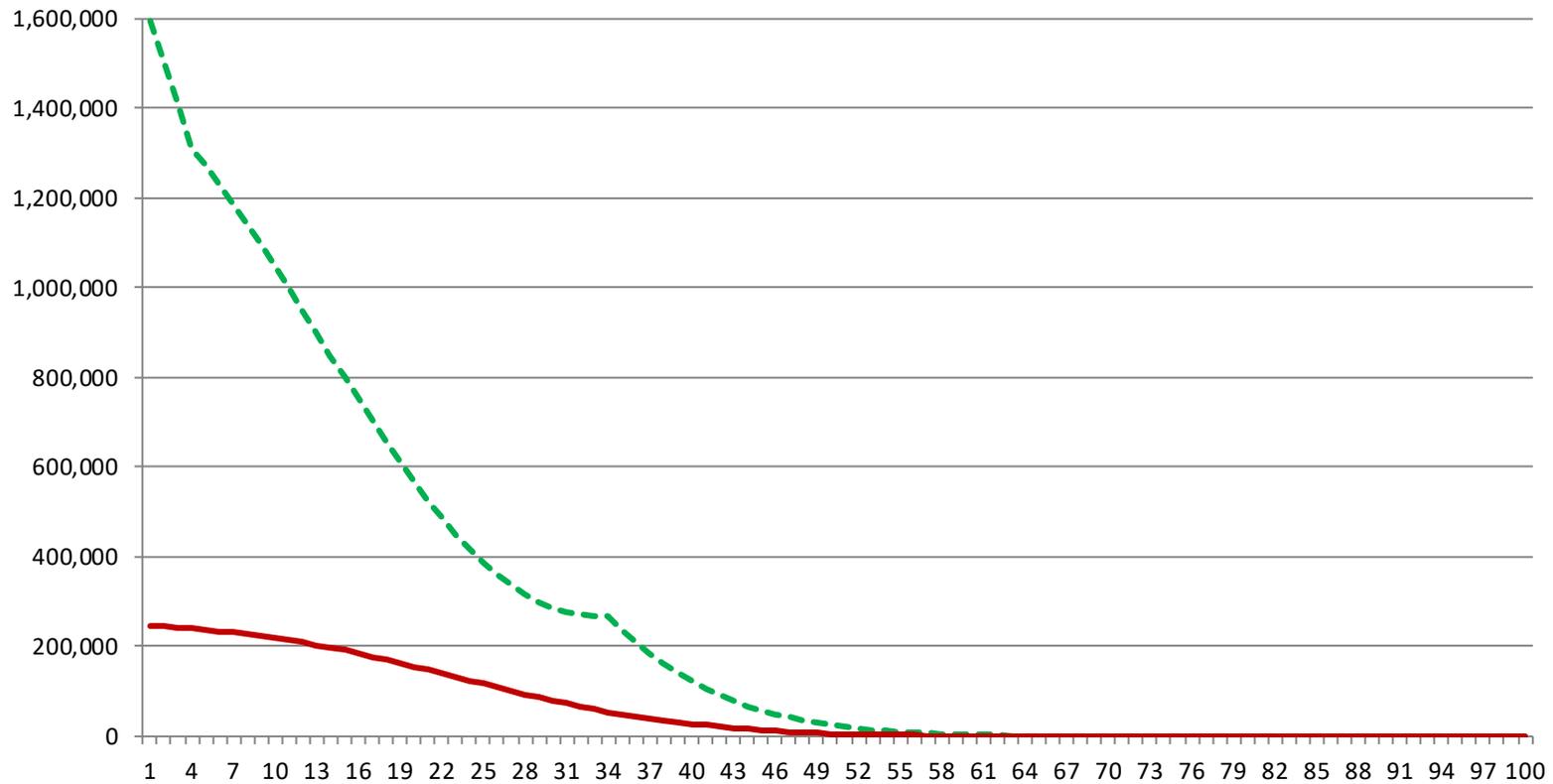
Fiscal Year	Projected Beginning	Projected Benefit	Funded Portion of	Unfunded Portion	Present Value of	Present Value of	Present Value of Benefit
Ending June 30,	Plan Net Position	Payments	Benefit Payments	of Benefit Payments	Funded Benefit Payments using Expected Return Rate (v)	Unfunded Benefit Payments using Municipal Bond Rate (vf)	Payments using Single Discount Rate (sdr)
(a)	(b)	(c)	(d)	(e)	(f)=(d)*v ^a ((a)-.5)	(g)=(e)*vf ^a ((a)-.5)	(h)=(c)/((1+sdr) ^a (a-.5)
2020	\$ 1,678,658,059	\$ 246,539,972	\$ 246,539,972	\$ -	\$ 237,917,092	\$ -	\$ 237,917,092
2021	1,592,943,701	245,085,260	245,085,260	-	220,258,204	-	220,258,204
2022	1,502,737,684	242,863,029	242,863,029	-	203,260,462	-	203,260,462
2023	1,408,431,860	240,187,961	240,187,961	-	187,205,815	-	187,205,815
2024	1,310,133,561	237,493,538	237,493,538	-	172,383,819	-	172,383,819
2025	1,271,719,043	234,701,767	234,701,767	-	158,649,118	-	158,649,118
2026	1,230,813,731	231,605,211	231,605,211	-	145,796,208	-	145,796,208
2027	1,187,549,636	227,934,289	227,934,289	-	133,623,907	-	133,623,907
2028	1,142,347,862	223,716,795	223,716,795	-	122,137,687	-	122,137,687
2029	1,095,631,790	218,946,994	218,946,994	-	111,318,332	-	111,318,332
2030	1,047,861,989	213,996,253	213,996,253	-	101,323,568	-	101,323,568
2031	999,148,191	208,749,796	208,749,796	-	92,046,433	-	92,046,433
2032	949,727,165	203,293,223	203,293,223	-	83,479,609	-	83,479,609
2033	899,764,446	197,494,767	197,494,767	-	75,524,820	-	75,524,820
2034	849,574,334	191,277,716	191,277,716	-	68,120,070	-	68,120,070
2035	799,573,812	184,593,749	184,593,749	-	61,221,546	-	61,221,546
2036	750,260,710	177,678,054	177,678,054	-	54,877,927	-	54,877,927
2037	701,925,887	170,493,233	170,493,233	-	49,039,683	-	49,039,683
2038	654,920,419	163,189,239	163,189,239	-	43,712,800	-	43,712,800
2039	609,465,904	155,625,146	155,625,146	-	38,821,604	-	38,821,604
2040	565,946,331	147,897,980	147,897,980	-	34,358,370	-	34,358,370
2041	524,673,480	140,090,346	140,090,346	-	30,307,849	-	30,307,849
2042	485,896,544	132,210,219	132,210,219	-	26,637,198	-	26,637,198
2043	449,874,842	124,375,340	124,375,340	-	23,336,428	-	23,336,428
2044	416,764,822	116,587,330	116,587,330	-	20,371,737	-	20,371,737
2045	386,732,797	108,832,730	108,832,730	-	17,709,766	-	17,709,766
2046	359,971,305	101,181,949	101,181,949	-	15,333,205	-	15,333,205
2047	336,614,128	93,721,443	93,721,443	-	13,226,516	-	13,226,516
2048	316,715,334	86,472,114	86,472,114	-	11,364,732	-	11,364,732
2049	300,311,320	79,484,629	79,484,629	-	9,728,432	-	9,728,432
2050	287,388,666	72,785,502	72,785,502	-	8,296,238	-	8,296,238
2051	277,905,490	66,396,146	66,396,146	-	7,047,836	-	7,047,836
2052	271,794,625	60,334,265	60,334,265	-	5,964,218	-	5,964,218
2053	268,965,606	54,615,294	54,615,294	-	5,027,828	-	5,027,828
2054	269,305,292	49,249,561	49,249,561	-	4,222,261	-	4,222,261
2055	238,145,499	44,241,127	44,241,127	-	3,532,202	-	3,532,202
2056	209,876,069	39,591,819	39,591,819	-	2,943,753	-	2,943,753
2057	184,338,169	35,297,829	35,297,829	-	2,444,109	-	2,444,109
2058	161,365,190	31,351,966	31,351,966	-	2,021,687	-	2,021,687
2059	140,785,680	27,744,484	27,744,484	-	1,666,105	-	1,666,105
2060	122,425,629	24,462,814	24,462,814	-	1,368,071	-	1,368,071
2061	106,111,215	21,491,868	21,491,868	-	1,119,317	-	1,119,317
2062	91,671,421	18,814,849	18,814,849	-	912,549	-	912,549
2063	78,940,012	16,413,760	16,413,760	-	741,379	-	741,379
2064	67,757,137	14,269,798	14,269,798	-	600,242	-	600,242
2065	57,970,633	12,363,723	12,363,723	-	484,322	-	484,322
2066	49,437,041	10,676,129	10,676,129	-	389,472	-	389,472
2067	42,022,429	9,187,852	9,187,852	-	312,142	-	312,142
2068	35,602,834	7,880,365	7,880,365	-	249,322	-	249,322
2069	30,064,349	6,736,049	6,736,049	-	198,471	-	198,471

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

Fiscal Year	Projected			Unfunded Portion	Present Value of	Present Value of	Present Value of
Ending June 30,	Beginning Plan Net Position	Projected Benefit Payments	Funded Portion of Benefit Payments	of Benefit Payments	Funded Benefit Payments using Expected Return Rate (v)	Unfunded Benefit Payments using Municipal Bond Rate (vf)	Benefit Payments using Single Discount Rate (sdr)
(a)	(b)	(c)	(d)	(e)	(f)=(d)*v ⁿ ((a)-.5)	(g)=(e)*vf ⁿ ((a)-.5)	(h)=(c)/(1+sdr) ⁿ ((a)-.5)
2070	\$ 25,302,913	\$ 5,738,341	\$ 5,738,341	\$ -	\$ 157,454	\$ -	\$ 157,454
2071	21,223,951	4,871,735	4,871,735	-	124,488	-	124,488
2072	17,741,977	4,121,776	4,121,776	-	98,086	-	98,086
2073	14,780,172	3,475,134	3,475,134	-	77,014	-	77,014
2074	12,269,865	2,919,623	2,919,623	-	60,256	-	60,256
2075	10,149,941	2,444,143	2,444,143	-	46,976	-	46,976
2076	8,366,280	2,038,630	2,038,630	-	36,489	-	36,489
2077	6,871,195	1,694,029	1,694,029	-	28,237	-	28,237
2078	5,622,863	1,402,237	1,402,237	-	21,767	-	21,767
2079	4,584,772	1,156,089	1,156,089	-	16,713	-	16,713
2080	3,725,139	949,277	949,277	-	12,780	-	12,780
2081	3,016,372	776,261	776,261	-	9,732	-	9,732
2082	2,434,586	632,201	632,201	-	7,381	-	7,381
2083	1,959,144	512,868	512,868	-	5,577	-	5,577
2084	1,572,274	414,528	414,528	-	4,198	-	4,198
2085	1,258,755	333,892	333,892	-	3,149	-	3,149
2086	1,005,658	268,083	268,083	-	2,354	-	2,354
2087	802,077	214,606	214,606	-	1,755	-	1,755
2088	638,887	171,329	171,329	-	1,305	-	1,305
2089	508,497	136,450	136,450	-	968	-	968
2090	404,629	108,450	108,450	-	716	-	716
2091	322,110	86,051	86,051	-	529	-	529
2092	256,712	68,196	68,196	-	391	-	391
2093	204,990	54,016	54,016	-	288	-	288
2094	164,145	42,794	42,794	-	213	-	213
2095	131,914	33,947	33,947	-	157	-	157
2096	106,471	27,003	27,003	-	116	-	116
2097	86,347	21,570	21,570	-	87	-	87
2098	70,368	17,328	17,328	-	65	-	65
2099	57,604	14,020	14,020	-	49	-	49
2100	47,327	11,438	11,438	-	37	-	37
2101	38,968	9,411	9,411	-	28	-	28
2102	32,092	7,805	7,805	-	22	-	22
2103	26,372	6,517	6,517	-	17	-	17
2104	21,565	5,461	5,461	-	13	-	13
2105	17,497	4,575	4,575	-	10	-	10
2106	14,047	3,816	3,816	-	8	-	8
2107	11,129	3,157	3,157	-	6	-	6
2108	8,679	2,582	2,582	-	5	-	5
2109	6,644	2,080	2,080	-	4	-	4
2110	4,979	1,644	1,644	-	3	-	3
2111	3,643	1,272	1,272	-	2	-	2
2112	2,593	962	962	-	1	-	1
2113	1,788	708	708	-	1	-	1
2114	1,186	507	507	-	1	-	1
2115	749	351	351	-	0	-	0
2116	441	234	234	-	0	-	0
2117	230	151	151	-	0	-	0
2118	91	94	94	-	0	-	0
2119	0	-	-	-	-	-	-
Totals	\$ 2,613,353,913	\$ 2,613,353,913	\$ 2,613,353,913	\$ -	\$ 2,613,353,913	\$ -	\$ 2,613,353,913

Projection of Plan Net Position and Benefit Payments End of Year

\$ [thousands]



--- Projected Plan Net Position

— Projected Benefit Payments for Current Members

Year

SECTION H

GLOSSARY OF TERMS

Glossary of Terms

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

Glossary of Terms

AFC	Average Final Compensation.
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).
APTE	Association of Professional and Technical Employees.
ASF	Annuity Savings Fund.
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 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.
DIA	Detroit Institute of Art.
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: <ol style="list-style-type: none">1. The benefit payments to be made while the pension plans’ fiduciary net position is projected to be greater than the benefit payments that are projected to be made in the period; and2. The present value of the benefit payments not in (1) above, discounted using the municipal bond rate.

Glossary of Terms

<i>D.O.T.</i>	Department of Transportation.
<i>DWSD</i>	Detroit Water and Sewerage Department.
<i>EMS</i>	Emergency Medical Service.
<i>Entry Age Actuarial Cost Method (EAN)</i>	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 ages(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.
<i>GASB</i>	The Governmental Accounting Standards Board is an organization that exists in order to promulgate accounting standards for governmental entities.
<i>GLWA</i>	Great Lakes Water Authority.
<i>Fiduciary Net Position</i>	The fiduciary net position is the value of the assets of the trust.
<i>Long-Term Expected Rate of Return</i>	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.
<i>Money-Weighted Rate of Return</i>	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.
<i>Multiple-Employer Defined Benefit Pension Plan</i>	A multiple-employer plan is a defined benefit pension plan that is used to provide pensions to the employees of more than one employer.
<i>Municipal Bond Rate</i>	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.
<i>Net Pension Liability (NPL)</i>	The NPL is the liability of employers and non-employer contribution entities to plan members for benefits provided through a defined benefit pension plan.

Glossary of Terms

<i>Non-Employer Contribution Entities</i>	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.
<i>Normal Cost</i>	The actuarial present value of the pension trust benefits allocated to the current year by the actuarial cost method. Also known as service cost.
<i>POA</i>	The 8th Amended Plan for the Adjustment of the Debt of the City of Detroit.
<i>SAAA</i>	Senior Accountants, Analysts, and Appraisers Association.
<i>UTGO</i>	Unlimited Tax General Obligation.