

# The General Retirement System of the City of Detroit

GASB Statement No. 68 Employer Reporting and  
Accounting Schedules of Component II

June 30, 2017



July 23, 2018

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. 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 No. 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 No. 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, 2016. The total pension liability was rolled-forward from the valuation date to the plan year ending June 30, 2017 using generally accepted actuarial principles. The asset information as of June 30, 2017 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. Final calculations of frozen accrued benefits for active members were not provided. 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 6.91%, net of investment expenses, as of June 30, 2017, down from 7.23%, net of investment expenses, as of June 30, 2016. We have reviewed this assumption based on the System's asset allocation and have determined it to be 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, 2017. We understand that Component I is a separate plan for GASB No. 67 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 No. 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.

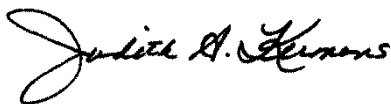
This report supplements our GASB Statement No. 67 report dated October 31, 2017. The Total Pension Liability, Plan Fiduciary Net Position, Net Pension Liability, and corresponding schedules are unchanged from the prior report. However, the GASB Statement No. 68 specific schedules (such as Pension Expense, deferred inflows/outflows, proportionate share, etc.) have been added to this report. In addition, we received revised asset information. While the Plan Fiduciary Net Position is not changed, administrative expenses and investment income differ from what was reported for the GASB Statement No. 67 report. As a result, the revenue and expenditure exhibits have been updated.

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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DTK/JAK/KGA:dj



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## SECTION A

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### EXECUTIVE SUMMARY

# Executive Summary as of June 30, 2017

Actuarial Valuation Date	June 30, 2016
Measurement Date of the Net Pension Liability	June 30, 2017
Employer's Fiscal Year Ending Date (Reporting Date)	June 30, 2018

## Membership

Number of	
- Retirees and Beneficiaries	11,926
- Inactive, Nonretired Members	3,588
- Active Members	3,236
- Total	18,750
Covered Payroll	\$ 143,882,722

## Net Pension Liability

Total Pension Liability	\$ 2,910,509,226
Plan Fiduciary Net Position	1,966,728,975
Net Pension Liability	\$ 943,780,251
Plan Fiduciary Net Position as a Percentage of Total Pension Liability	67.57%
Net Pension Liability as a Percentage of Covered Payroll	655.94%

## Development of the Single Discount Rate

Single Discount Rate	6.91%
Long-Term Expected Rate of Investment Return	6.91%
Long-Term Municipal Bond Rate*	3.56%
Last year ending June 30 in the 2018 to 2117 projection period for which projected benefit payments are fully funded	2117

<b>Total Pension Expense</b>	<b>\$ 113,958,599</b>
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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	118,845,862	86,449,730
<b>Total</b>	<b>\$ 118,845,862</b>	<b>\$ 86,449,730</b>

\*Source: Fixed-income municipal bonds with 20 years to maturity that include only federally tax-exempt municipal bonds as reported in Fidelity Index's "20-Year Municipal GO AA Index" as of June 30, 2017. 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

For purposes of determining the total pension liability as of June 30, 2017, the following actuarial assumptions were changed/modified from those used in the June 30, 2016 funding valuation:

- At the direction of the System and approval of the Systems' Auditor, the long-term expected return on assets was 6.91% net of investment expenses, as of June 30, 2017 (it was 6.75% net of investment and administrative expenses, in the June 30, 2016 funding valuation, as required by the Plan of Adjustment). The Single Discount Rate (SDR) changed to 6.91% from 7.23% when compared to the June 30, 2016 GASB Statement No. 68 valuation.

All other actuarial assumptions were the same as those used in the June 30, 2016 actuarial valuation (the funding 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 making this report are included in the June 30, 2016 funding valuation report.

## Magnitude of Administrative Expenses

Combined Component I (Hybrid) and Component II (Legacy) administrative expenses for the 2017 fiscal year are approximately 30% higher when compared to the 2016 fiscal year expenses. We understand that this increase is temporary. In addition, ongoing payroll (Component I payroll) has decreased with the departure of GLWA. We will be monitoring actual expenses as a percent of ongoing payroll and may recommend an increase in this assumption in future valuations. For this valuation, we have adjusted the assumption as a percent to prevent the projected dollars from decreasing due to the lower payroll. This brings the expenses as a percent of Component I payroll up from 3.0% to 3.55% due to the lower payroll. In addition, we allocated 71% of the expenses to Component II and 29% to Component I, consistent with this year's allocation as shown in the assets.

## Changes from GASB Statement No. 67 Report

This report supplements our GASB Statement No. 67 report dated October 31, 2017. The Total Pension Liability, Plan Fiduciary Net Position, Net Pension Liability, and corresponding schedules are unchanged from the prior report. However, the GASB Statement No. 68 specific schedules (such as Pension Expense, deferred inflows/outflows, proportionate share, etc.) have been added to this report. In addition, we received revised asset information. While the Plan Fiduciary Net Position is not changed, administrative expenses and investment income differ from what was reported for the GASB Statement No. 67 report. As a result, the revenue and expenditure exhibits have been updated.

## Accounting Standard

For State and local government employers (as well as certain non-employers) that contribute to a Defined Benefit (DB) pension plan administered through a trust or equivalent arrangement, Governmental Accounting Standards Board (GASB) Statement No. 68 establishes standards for pension accounting and financial reporting. Under GASB Statement No. 68, the employer must 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 is not included in this report if it is not actuarial in nature, such as the notes to the financial statements regarding accounting policies and investments. As a result, the Retirement System and/or plan sponsor is responsible for preparing and disclosing the non-actuarial information needed to comply with these accounting standards.

## Financial Statements

GASB Statement No. 68 requires State and local government employers that contribute to DB pension plans to recognize the net pension liability and the pension expense on their financial statements, along with the related deferred outflows of resources and deferred inflows of resources. 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, 2017.

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.

## 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.



## Notes to Financial Statements

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

In addition, GASB Statement No. 68 requires the notes of the financial statements for the employers to include certain additional information, including:

- a description of the types of benefits provided by the plan, as well as automatic or ad hoc COLAs;
- the number and classes of employees covered by the benefit terms;
- for the current year, sources of changes in the net pension liability;
- significant assumptions and methods used to calculate the total pension liability;
- inputs to the Single Discount Rate;
- certain information about mortality assumptions and the dates of experience studies;
- the date of the valuation used to determine the total pension liability;
- information about changes of assumptions or other inputs and benefit terms;
- the basis for determining contributions to the plan, including a description of the plan's funding policy, as well as member and employer contribution requirements;
- the total pension liability, fiduciary net position, net pension liability, and the pension plan's fiduciary net position as a percentage of the total pension liability;
- the net pension liability using a discount rate that is 1% higher and 1% lower than used to calculate the total pension liability and net pension liability for financial reporting purposes;
- a description of the system that administers the pension plan; and
- a description of the terms of the plan's deferred retirement option program (DROP) and the total DROP balance for those members currently participating in the DROP. (The General Retirement System of the City of Detroit does not have a DROP program.)

## Required Supplementary Information

The financial statements of employers also include required supplementary information showing the 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 actual employer contributions to the actuarially determined contributions based on the plan's funding policy.

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

## Timing of the Valuation

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

The total pension liability shown in this report is based on an actuarial valuation performed as of June 30, 2016, rolled to the plan year end of June 30, 2017.

## Single Discount Rate

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

For the purpose of this valuation, the expected rate of return on pension plan investments is 6.91%; the municipal bond rate is 3.56% (based on the weekly rate closest to but not later than the plan year end of the "20-Bond GO Index" rate from the Bond Buyer Index); and the resulting Single Discount Rate is 6.91%, as of June 30, 2017.

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

## 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 (67.57% as of June 30, 2017). 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.

## Benefits as of June 30, 2016

As of the June 30, 2016 census date:

- 1) Frozen Accrued Benefit amounts were not available for active members.

Data provided was used to estimate the impact of the above information. As this data becomes available in the future, the results of our liability calculations may differ.

The reported June 30, 2017 Annuity Savings Fund (ASF) balance 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, 2017 in accordance with GAAP accounting.

## SECTION B

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### 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, 2017

## Assets

Cash and Cash Equivalents	\$ 108,123,413
Receivables	123,333,387
Investments at Fair Value	1,752,552,204
Cash and Investments held as collateral for securities lending	71,779,248
Capital Assets - Net	<u>267,889</u>
<b>Total Assets</b>	<u><u>\$ 2,056,056,141</u></u>

## Liabilities

Accounts Payable	<u>\$ 89,327,166</u>
<b>Total Liabilities</b>	<u><u>\$ 89,327,166</u></u>

<b>Net Position Restricted for Pensions</b>	<u><u>\$ 1,966,728,975</u></u>
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<b>ASF Reserve</b>	\$ 120,921,554
<b>Other Reserves</b>	<u>1,845,807,421</u>
<b>Plan Fiduciary Net Position</b>	<u><u>\$ 1,966,728,975</u></u>

# Statement of Changes in Fiduciary Net Position for Year Ended June 30, 2017

## Additions

Contributions	
Employer	\$ 91,238,402
Employee	-
Other	-
Total Contributions	<u>\$ 91,238,402</u>
Investment Income	
Investment Income	<u>\$ 206,896,567</u>
Net Investment Income	<u>\$ 206,896,567</u>
Other Income (Including ASF Interest)^	<u>\$ 8,324,075</u>
<b>Total Additions</b>	<u><u>\$ 306,459,044</u></u>

## Deductions

Benefit Payments, including Refunds of Employee Contributions*	\$ 267,249,539
Pension Plan Administrative Expense	6,021,837
Other	-
<b>Total Deductions</b>	<u>\$ 273,271,376</u>
 <b>Net Increase in Net Position</b>	 <b>\$ 33,187,668</b>

## Net Position Restricted for Pensions

Beginning of Year	<u>\$ 1,933,541,307</u>
End of Year	<u><u>\$ 1,966,728,975</u></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.

\* Includes approximately \$2.9 million of adjusted loan balances that were treated as refunds of ASF contributions.

## Statement of Pension Expense Under GASB Statement No. 68

### Fiscal Year Ended June 30, 2017\*

A. Expense	General	DOT	DWSD	Library	Total
1. Service Cost	\$ -	\$ -	\$ -	\$ -	\$ -
2. Interest on the Total Pension Liability	111,696,826	29,480,676	53,810,904	6,930,830	201,919,236
3. Current-Period Benefit Changes	-	-	-	-	-
4. Employee Contributions (made negative for addition here)	-	-	-	-	-
5. Projected Earnings on Plan Investments (made negative for addition here)	(76,351,464)	(16,098,747)	(35,478,877)	(5,586,372)	(133,515,460)
6. Pension Plan Administrative Expense	5,024,638	749,619	-	247,580	6,021,837
7. Other Changes in Plan Fiduciary Net Position	(4,567,412)	(1,436,415)	(2,125,248)	(195,000)	(8,324,075)
8. Recognition of Outflow (Inflow) of Resources due to Liabilities	18,837,086	5,220,442	24,925,019	(1,844,278)	47,138,269
9. Recognition of Outflow (Inflow) of Resources due to Assets	8,533,916	(424,293)	(5,680,643)	(1,710,188)	718,792
<b>10. Total Pension Expense</b>	<b>\$ 63,173,590</b>	<b>\$ 17,491,282</b>	<b>\$ 35,451,155</b>	<b>\$ (2,157,428)</b>	<b>\$ 113,958,599</b>

\*Totals may not add due to rounding.

# Statement of Outflows and Inflows Arising from Current Reporting Period Fiscal Year Ended June 30, 2017\*

<b>A. Outflows (Inflows) of Resources due to Liabilities</b>	<b>General</b>	<b>DOT</b>	<b>DWSD</b>	<b>Library</b>	<b>Total</b>
1. Difference between expected and actual experience of the Total Pension Liability (gains) or losses	\$ (23,006,975)	\$ (5,802,247)	\$ 3,370,105	\$ (2,069,263)	\$ (27,508,380)
2. Assumption Changes (gains) or losses	\$ 41,844,061	\$ 11,022,689	\$ 21,554,914	\$ 2,504,293	\$ 76,925,957
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	\$ (23,006,975)	\$ (5,802,247)	\$ 3,370,105	\$ (2,069,263)	\$ (27,508,380)
5. Outflow (Inflow) of Resources to be recognized in the current pension expense for Assumption Changes	\$ 41,844,061	\$ 11,022,689	\$ 21,554,914	\$ 2,504,293	\$ 76,925,957
6. Outflow (Inflow) of Resources to be recognized in the current pension expense due to Liabilities	\$ 18,837,086	\$ 5,220,442	\$ 24,925,019	\$ 435,030	\$ 49,417,577
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>B. Outflows (Inflows) of Resources due to Assets</b>					
1. Net difference between projected and actual earnings on pension plan investments (gains) or losses	\$ (43,059,585)	\$ (7,871,494)	\$ (19,730,574)	\$ (2,719,454)	\$ (73,381,107)
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	\$ (8,611,917)	\$ (1,574,299)	\$ (3,946,115)	\$ (543,891)	\$ (14,676,221)
4. Deferred Outflow (Inflow) of Resources to be recognized in future pension expenses due to Assets	\$ (34,447,668)	\$ (6,297,195)	\$ (15,784,459)	\$ (2,175,563)	\$ (58,704,886)

\*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	\$ 41,844,061	\$ 23,006,975	\$ 18,837,086
2. Due to Assets	\$ 24,951,060	16,417,144	8,533,916
<b>3. Total</b>	<b>\$ 66,795,121</b>	<b>\$ 39,424,119</b>	<b>\$ 27,371,002</b>

## 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	\$ -	\$ 23,006,975	\$ (23,006,975)
2. Assumption Changes	\$ 41,844,061	-	41,844,061
3. Net Difference between projected and actual earnings on pension plan investments	\$ 24,951,060	16,417,144	8,533,916
<b>4. Total</b>	<b>\$ 66,795,121</b>	<b>\$ 39,424,119</b>	<b>\$ 27,371,002</b>

## 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	\$ 68,815,107	42,252,894	26,562,213
<b>4. Total</b>	<b>\$ 68,815,107</b>	<b>\$ 42,252,894</b>	<b>\$ 26,562,213</b>

## 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
2018	\$ 8,533,917
2019	16,339,145
2020	10,301,068
2021	(8,611,917)
2022	-
Thereafter	-
<b>Total</b>	<b>\$ 26,562,213</b>

# 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	\$ 11,022,689	\$ 5,802,247	\$ 5,220,442
2. Due to Assets	\$ 5,162,784	5,587,077	(424,293)
<b>3. Total</b>	<b>\$ 16,185,473</b>	<b>\$ 11,389,324</b>	<b>\$ 4,796,149</b>

## 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	\$ -	\$ 5,802,247	\$ (5,802,247)
2. Assumption Changes	\$ 11,022,689	-	11,022,689
3. Net Difference between projected and actual earnings on pension plan investments	\$ 5,162,784	5,587,077	(424,293)
<b>4. Total</b>	<b>\$ 16,185,473</b>	<b>\$ 11,389,324</b>	<b>\$ 4,796,149</b>

## 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	\$ 14,158,732	10,309,975	3,848,757
<b>4. Total</b>	<b>\$ 14,158,732</b>	<b>\$ 10,309,975</b>	<b>\$ 3,848,757</b>

## 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
2018	\$ (424,295)
2019	3,588,484
2020	2,258,866
2021	(1,574,298)
2022	-
Thereafter	-
<b>Total</b>	<b>\$ 3,848,757</b>

# 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	\$ 24,925,019	\$ -	\$ 24,925,019
2. Due to Assets	\$ 11,292,804	16,973,447	(5,680,643)
<b>3. Total</b>	<b>\$ 36,217,823</b>	<b>\$ 16,973,447</b>	<b>\$ 19,244,376</b>

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

	Outflows of Resources	Inflows of Resources	Net Outflows of Resources
1. Differences between expected and actual experience	\$ 3,370,105	\$ -	\$ 3,370,105
2. Assumption Changes	\$ 21,554,914	-	21,554,914
3. Net Difference between projected and actual earnings on pension plan investments	\$ 11,292,804	16,973,447	(5,680,643)
<b>4. Total</b>	<b>\$ 36,217,823</b>	<b>\$ 16,973,447</b>	<b>\$ 19,244,376</b>

## 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	\$ 31,090,950	28,811,792	2,279,158
<b>4. Total</b>	<b>\$ 31,090,950</b>	<b>\$ 28,811,792</b>	<b>\$ 2,279,158</b>

## 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
2018	\$ (5,680,644)
2019	7,346,689
2020	4,559,227
2021	(3,946,114)
2022	-
Thereafter	-
<b>Total</b>	<b>\$ 2,279,158</b>

# 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	\$ 2,504,293	\$ 4,348,571	\$ (1,844,278)
2. Due to Assets	\$ 1,733,209	3,443,397	(1,710,188)
<b>3. Total</b>	<b>\$ 4,237,502</b>	<b>\$ 7,791,968</b>	<b>\$ (3,554,466)</b>

## 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	\$ -	\$ 2,069,263	\$ (2,069,263)
2. Assumption Changes	\$ 2,504,293	2,279,308	224,985
3. Net Difference between projected and actual earnings on pension plan investments	\$ 1,733,209	3,443,397	(1,710,188)
<b>4. Total</b>	<b>\$ 4,237,502</b>	<b>\$ 7,791,968</b>	<b>\$ (3,554,466)</b>

## 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	\$ 4,781,073	5,075,069	(293,996)
<b>4. Total</b>	<b>\$ 4,781,073</b>	<b>\$ 5,075,069</b>	<b>\$ (293,996)</b>

## 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
2018	\$ (1,710,188)
2019	1,189,318
2020	770,764
2021	(543,890)
2022	-
Thereafter	-
<b>Total</b>	<b>\$ (293,996)</b>

# 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	\$ 80,296,062	\$ 33,157,793	\$ 47,138,269
2. Due to Assets	\$ 43,139,857	42,421,065	718,792
<b>3. Total</b>	<b>\$ 123,435,919</b>	<b>\$ 75,578,858</b>	<b>\$ 47,857,061</b>

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

	Outflows of Resources	Inflows of Resources	Net Outflows of Resources
1. Differences between expected and actual experience	\$ 3,370,105	\$ 30,878,485	\$ (27,508,380)
2. Assumption Changes	\$ 76,925,957	2,279,308	74,646,649
3. Net Difference between projected and actual earnings on pension plan investments	\$ 43,139,857	42,421,065	718,792
<b>4. Total</b>	<b>\$ 123,435,919</b>	<b>\$ 75,578,858</b>	<b>\$ 47,857,061</b>

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

	Deferred Outflows of Resources	Deferred Inflows of Resources	Net Deferred Outflows of Resources
1. Differences between expected and actual experience	\$ -	\$ -	\$ -
2. Assumption Changes	-	-	-
3. Net Difference between projected and actual earnings on pension plan investments	\$ 118,845,862	86,449,730	32,396,132
<b>4. Total</b>	<b>\$ 118,845,862</b>	<b>\$ 86,449,730</b>	<b>\$ 32,396,132</b>

## 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
2018	\$ 718,790
2019	28,463,636
2020	17,889,925
2021	(14,676,219)
2022	-
Thereafter	-
<b>Total</b>	<b>\$ 32,396,132</b>

# Schedule of Proportionate Employer Share for Year Ended June 30, 2017 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
\$ 1,574,112,909	General City	98.37%	\$ 469,744,319	\$ -	\$ 67,693,421	\$ -	\$ -	\$ 67,693,421
22,562,765	Parking	1.41%	6,733,145	-	970,293	-	-	970,293
3,520,431	Airport	0.22%	1,050,562	-	151,393	-	-	151,393
<b>\$ 1,600,196,105</b>	<b>Total for All Employers</b>	<b>100.00%</b>	<b>\$ 477,528,026</b>	<b>\$ -</b>	<b>\$ 68,815,107</b>	<b>\$ -</b>	<b>\$ -</b>	<b>\$ 68,815,107</b>

## Deferred Inflows of Resources

				Pension Expense				
				Net Amortization of Deferred Amounts from Changes in Proportion and Differences Between Employer Contributions and Proportionate Share of Contributions				
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	Proportionate Share of Contributions	Total Employer Pension Expense
General City	\$ -	\$ 41,564,172	\$ -	\$ -	\$ 41,564,172	\$ 62,143,860	\$ (616,288)	\$ 61,527,572
Parking	-	595,766	-	-	595,766	890,748	440,657	1,331,405
Airport	-	92,956	-	-	92,956	138,982	175,631	314,613
<b>Total for All Employers</b>	<b>\$ -</b>	<b>\$ 42,252,894</b>	<b>\$ -</b>	<b>\$ -</b>	<b>\$ 42,252,894</b>	<b>\$ 63,173,590</b>	<b>\$ -</b>	<b>\$ 63,173,590</b>

\* Totals may not add due to rounding.

## Schedule of Proportionate Employer Share for Year Ended June 30, 2017 General Subgroup\*

Employer	Employer Allocation Percentage	Schedule of Deferred Inflows and Outflows						
		2018	2019	2020	2021	2022	Thereafter	Total
General City	98.37%	\$ 8,394,814	\$ 16,072,817	\$ 10,133,161	\$ (8,471,543)	\$ -	\$ -	\$ 26,129,249
Parking	1.41%	120,328	230,382	145,245	(121,428)	-	-	374,527
Airport	0.22%	18,775	35,946	22,662	(18,946)	-	-	58,437
<b>TOTAL</b>	<b>100.00%</b>	<b>\$ 8,533,917</b>	<b>\$ 16,339,145</b>	<b>\$ 10,301,068</b>	<b>\$ (8,611,917)</b>	<b>\$ -</b>	<b>\$ -</b>	<b>\$ 26,562,213</b>

\* Totals may not add due to rounding.

## Determination of Employer Contribution Allocation for Year Ended June 30, 2017

Employer	General City	Parking	Airport	General Total	DOT	DWSD	Library	Total
Contributions Before General Breakdown				\$45,388,561	\$100,841	\$42,900,000	\$2,849,000	\$91,238,402
General Employer Allocation Percent	98.44%	1.31%	0.25%	100.00%	N/A	N/A	N/A	N/A
Times General Total	\$45,388,561	\$45,388,561	\$45,388,561	\$45,388,561	N/A	N/A	N/A	N/A
Contribution Allocation Dollar	\$44,680,500	\$ 594,590	\$ 113,471	\$45,388,561	\$100,841	\$42,900,000	\$2,849,000	\$91,238,402

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

## Fiscal Year Ended June 30, 2017\*

	General	DOT	DWSD	Library	Total
<b>A. Total Pension Liability</b>					
1. Service Cost	\$ -	\$ -	\$ -	\$ -	\$ -
2. Interest on the Total Pension Liability	111,696,826	29,480,676	53,810,904	6,930,830	201,919,236
3. Changes of benefit terms	-	-	-	-	-
4. Difference between expected and actual experience of the Total Pension Liability	(23,006,975)	(5,802,247)	3,370,105	(2,069,263)	(27,508,380)
5. Changes of assumptions	41,844,061	11,022,689	21,554,914	2,504,293	76,925,957
6. Benefit payments, including refunds of employee contributions^	(150,490,982)	(36,843,199)	(72,661,992)	(7,253,366)	(267,249,539)
7. Net change in Total Pension Liability	\$ (19,957,070)	\$ (2,142,081)	\$ 6,073,931	\$ 112,494	\$ (15,912,726)
8. Total Pension Liability – Beginning	1,620,153,175	426,176,461	780,603,529	99,488,787	2,926,421,952
9. Total Pension Liability – Ending	<b>\$ 1,600,196,105</b>	<b>\$ 424,034,380</b>	<b>\$ 786,677,460</b>	<b>\$ 99,601,281</b>	<b>\$ 2,910,509,226</b>
<b>B. Plan Fiduciary Net Position</b>					
1. Contributions – employer	\$ 45,388,561	\$ 100,841	\$ 42,900,000	\$ 2,849,000	\$ 91,238,402
2. Contributions – employee	-	-	-	-	-
3. Net investment income	119,411,049	23,970,241	55,209,451	8,305,826	206,896,567
4. Benefit payments, including refunds of employee contributions^	(150,490,982)	(36,843,199)	(72,661,992)	(7,253,366)	(267,249,539)
5. Pension Plan Administrative Expense	(5,024,638)	(749,619)	-	(247,580)	(6,021,837)
6. Other	4,567,412	1,436,415	2,125,248	195,000	8,324,075
7. Net change in Plan Fiduciary Net Position	\$ 13,851,402	\$ (12,085,321)	\$ 27,572,707	\$ 3,848,880	\$ 33,187,668
8. Plan Fiduciary Net Position – Beginning	1,108,816,677	240,693,710	504,535,894	79,495,026	1,933,541,307
9. Plan Fiduciary Net Position – Ending	<b>\$ 1,122,668,079</b>	<b>\$ 228,608,389</b>	<b>\$ 532,108,601</b>	<b>\$ 83,343,906</b>	<b>\$ 1,966,728,975</b>
<b>C. Net Pension Liability</b>	<b>\$ 477,528,026</b>	<b>\$ 195,425,991</b>	<b>\$ 254,568,859</b>	<b>\$ 16,257,375</b>	<b>\$ 943,780,251</b>
<b>D. Plan Fiduciary Net Position as a percentage of the Total Pension Liability</b>	<b>70.16%</b>	<b>53.91%</b>	<b>67.64%</b>	<b>83.68%</b>	<b>67.57%</b>
<b>E. Covered-employee payroll</b>	<b>\$ 83,878,095</b>	<b>\$ 25,487,019</b>	<b>\$ 22,864,010</b>	<b>\$ 11,653,598</b>	<b>\$ 143,882,722</b>
<b>F. Net Pension Liability as a percentage of covered-employee payroll</b>	<b>569.31%</b>	<b>766.77%</b>	<b>1113.40%</b>	<b>139.51%</b>	<b>655.94%</b>

\*Totals may not add due to rounding.

^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 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,	2017	2016	2015	2014
<b>Total Pension Liability</b>				
Service Cost	\$ -	\$ -	\$ -	\$ 32,736,019
Interest on the Total Pension Liability	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	(27,508,380)	(43,719,112)	24,644,530	-
Assumption Changes	76,925,957	90,034,927	(101,559,893)	(271,190,194)
Benefit Payments	(242,938,006)	(242,470,451)	(253,217,949)	(253,683,194)
Refunds*	(24,311,533)	(49,811,728)	(44,321,041)	(144,050,613)
<b>Net Change in Total Pension Liability</b>	<b>(15,912,726)</b>	<b>(31,955,200)</b>	<b>(843,271,919)</b>	<b>(506,888,480)</b>
<b>Total Pension Liability - Beginning</b>	<b>2,926,421,952</b>	<b>2,958,377,152</b>	<b>3,801,649,071</b>	<b>4,308,537,551</b>
<b>Total Pension Liability - Ending (a)</b>	<b>\$ 2,910,509,226</b>	<b>\$ 2,926,421,952</b>	<b>\$ 2,958,377,152</b>	<b>\$ 3,801,649,071</b>
<b>Plan Fiduciary Net Position</b>				
Employer Contributions	\$ 91,238,402	\$ 104,792,657	\$ 189,282,095	\$ 25,126,131
Employee Contributions	-	-	609,073	10,241,761
Pension Plan Net Investment Income	206,896,567	(7,865,094)	93,054,978	289,789,607
Benefit Payments	(242,938,006)	(242,470,451)	(253,217,949)	(253,683,194)
Refunds*	(24,311,533)	(49,811,728)	(44,321,041)	(144,050,613)
Pension Plan Administrative Expense	(6,021,837)	(3,742,618)	(7,556,822)	(11,237,767)
Other	8,324,075	1,360,330	138,219,998	-
<b>Net Change in Plan Fiduciary Net Position</b>	<b>33,187,668</b>	<b>(197,736,904)</b>	<b>116,070,332</b>	<b>(83,814,075)</b>
<b>Plan Fiduciary Net Position - Beginning</b>	<b>1,933,541,307</b>	<b>2,131,278,211</b>	<b>2,015,207,879</b>	<b>2,099,021,954</b>
<b>Plan Fiduciary Net Position - Ending (b)</b>	<b>\$ 1,966,728,975</b>	<b>\$ 1,933,541,307</b>	<b>\$ 2,131,278,211</b>	<b>\$ 2,015,207,879</b>
<b>Net Pension Liability - Ending (a) - (b)</b>	<b>\$ 943,780,251</b>	<b>\$ 992,880,645</b>	<b>\$ 827,098,941</b>	<b>\$ 1,786,441,192</b>
<b>Plan Fiduciary Net Position as a Percentage</b>				
<b>of Total Pension Liability</b>	<b>67.57 %</b>	<b>66.07 %</b>	<b>72.04 %</b>	<b>53.01 %</b>
<b>Covered-Employee Payroll</b>	<b>\$ 143,882,722</b>	<b>\$ 200,722,197</b>	<b>\$ 203,507,079</b>	<b>\$ 213,291,083</b>
<b>Net Pension Liability as a Percentage</b>				
<b>of Covered-Employee Payroll</b>	<b>655.94 %</b>	<b>494.65 %</b>	<b>406.42 %</b>	<b>837.56 %</b>

**Notes to Schedule:**

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%

\* 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

<b>FY Ending June 30,</b>	<b>Actuarially Determined Contribution</b>	<b>Actual Contribution</b>	<b>Contribution Deficiency (Excess)</b>	<b>Covered Payroll*</b>	<b>Actual Contribution as a % of Covered Payroll</b>
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%

*\* 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:** The expected contributions for fiscal year 2015 and beyond are provided in the POA. Subsequent to the POA, the DIA entered into an agreement to pay part of its contribution requirement to the Detroit General Plan in a single lump sum payment (in 2016). Furthermore, we understand that the City has modified all of its outstanding UTGO Stub Bonds. The current contribution schedule (from Retirement System staff) showing the DIAs and UTGOs future contribution requirements is below:

Contribution Source (\$ millions)							
Fiscal Year	For DWSD Liabilities		For Other Liabilities				
	DWSD	Transfers	UTGO	State	DIA	Other	Transfers from DWSD
2018	45.4	(2.5)	-	-	0.4	22.5	2.5
2019	45.4	(2.5)	-	-	0.4	22.5	2.5
2020	45.4	(2.5)	-	-	0.4	2.5	2.5
2021	45.4	(2.5)	-	-	0.4	2.5	2.5
2022	45.4	(2.5)	-	-	0.4	2.5	2.5
2023	45.4	(2.5)	-	-	0.4	2.5	2.5
							<b>Total</b>

We understand that as of June 30, 2017 the Plan Fiduciary Net Position includes the remaining principal balance receivable on the UTGO bonds. The above schedule recognizes that change.

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

## Schedule of Investment Returns

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

## Single Discount Rate

A Single Discount Rate of 6.91%, net of investment expenses, was used to measure the total pension liability as of June 30, 2017. This Single Discount Rate was based on the expected rate of return on pension plan investments of 6.91% 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 6.91%, as well as what the plan's net pension liability would be if it were calculated using a Single Discount Rate that is one percent lower or one percent higher.

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

	1% Decrease 5.91%	Current Single Discount Rate Assumption 6.91%	1% Increase 7.91%
Total Pension Liability (TPL)	\$3,178,865,186	\$2,910,509,226	\$2,682,542,199
Net Position Restricted for Pensions	1,966,728,975	1,966,728,975	1,966,728,975
Net Pension Liability (NPL)	\$1,212,136,211	\$ 943,780,251	\$ 715,813,224

Users of this report should be aware that, in the actuary's judgement, a discount rate of 7.91% would not be a reasonable assumption for funding purposes.

## Summary of Population Statistics

Inactive Plan Members or Beneficiaries Currently Receiving Benefits	11,926
Inactive Plan Members Entitled to But Not Yet Receiving Benefits	3,588
Active Plan Members	<u>3,236</u>
Total Plan Members	18,750

Additional information regarding the plan population may be found in the June 30, 2016 actuarial valuation of the System.

### Additional Note

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

## SECTION C

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### 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 (“COLA’s”) 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 age 60. 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 \$9,000. 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) with no maximum.

## ***Non-Duty Disability Retirement***

**Eligibility** - Disability from any cause before age 60 with 10 or more years of service.

**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.

## ***Duty Death Before Retirement***

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

**Annual Amount** - One-third of final compensation 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 have 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 D

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### **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 6.91% per year, compounded annually (net after investment expenses) as of June 30, 2017. This assumption was provided by the Retirement System. We determined it to be reasonable when using a 2.50% assumed **price inflation**.

## 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. The tables are projected to be fully generational, based on the 2-dimensional, sex distinct mortality improvement scale MP-2014 (which was published and intended to be used with RP-2014). This table was first used as of June 30, 2014. 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 30 and 31. 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 32. 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 2016	Future Life Expectancy (years)	
	Males	Females
45	38.40	41.76
50	33.45	36.71
55	28.69	31.82
60	24.17	27.08
65	19.88	22.51
70	15.91	18.21
75	12.29	14.26
80	9.12	10.76

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

<b>Retirement Ages</b>	<b>Percent of Eligible Active Members Retiring Within Next Year With Reduced Benefits</b>
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

<b>Benefit Service</b>	Exact Fractional service is used to determine the amount of benefit payable.
<b>Decrement Operation</b>	Disability and mortality decrements do not operate during the first 5 years of service. Disability and withdrawal also do not operate during retirement eligibility.
<b>Decrement Timing</b>	Decrement of all types are assumed to occur mid-year.
<b>Eligibility Testing</b>	Eligibility for benefits is determined based upon the age nearest birthday and rounded service on the date the decrement is assumed to occur.
<b>Forfeitures</b>	None.
<b>Incidence of Contributions</b>	Contributions are assumed to be received at the middle of the year.
<b>Marriage Assumption</b>	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.
<b>Normal Form of Benefit</b>	Straight life is the normal form of benefit. Straight life is generally the most valuable under valuation assumptions. Actuarial equivalent factors are based on 7.5% interest and 1984 Group Annuity Mortality table.
<b>Service Credit Accruals</b>	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.
<b>Administrative Expenses</b>	3.55% of Component I payroll. 71% was allocated to Component II and 29% to Component I.
<b>Sick Leave</b>	As of June 30, 2014, this information was included in the 2014 Average Final Compensation (AFC) amounts.
<b>AFC Adjustment</b>	Reported 2014 AFC amounts were increased by 2.0% for active members due to data discrepancies related to the reported AFC. This adjustment was made based on discussions with System staff and the System's auditor and was checked for reasonableness for the 2016 valuation.
<b>Member Contributions</b>	Member contributions to this Component II plan are assumed to have ceased with the bankruptcy.

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

## SECTION E

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### **CALCULATION OF THE SINGLE DISCOUNT RATE**

## Calculation of the Single Discount Rate at End of Year

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

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

For the purpose of this valuation, the expected rate of return on pension plan investments is 6.91%; the municipal bond rate is 3.56%; and the resulting Single Discount Rate is 6.91% as of June 30, 2017.

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, 2016, the employer contributions for the 10-year period ending June 30, 2023 were set by the 8<sup>th</sup> 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 6.91% 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 6.91% 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 6.91% 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.

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, 2017, the benefit payments reflect the plan provisions in force as of June 30, 2017.

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

# Single Discount Rate Development

## Projection of Contributions at 6.91%

### 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
2018	\$ -	\$ -	\$ 3,781,169	\$ 64,493,831	\$ 68,275,000
2019	-	-	3,484,253	64,790,747	68,275,000
2020	-	-	3,221,813	44,953,187	48,175,000
2021	-	-	3,001,997	45,273,003	48,275,000
2022	-	-	2,812,694	45,462,306	48,275,000
2023	-	-	2,646,152	45,628,848	48,275,000
2024	-	-	2,482,333	101,132,093	103,614,426
2025	-	-	2,320,342	98,858,020	101,178,362
2026	-	-	2,169,217	96,583,946	98,753,163
2027	-	-	2,018,230	94,309,873	96,328,103
2028	-	-	1,876,325	92,035,799	93,912,124
2029	-	-	1,743,119	89,761,726	91,504,845
2030	-	-	1,615,711	87,487,653	89,103,364
2031	-	-	1,492,994	85,213,579	86,706,573
2032	-	-	1,375,492	82,939,506	84,314,998
2033	-	-	1,262,623	80,665,432	81,928,055
2034	-	-	1,156,746	78,391,359	79,548,105
2035	-	-	1,058,930	76,117,285	77,176,215
2036	-	-	968,166	73,843,212	74,811,378
2037	-	-	882,799	71,569,139	72,451,938
2038	-	-	803,521	69,295,065	70,098,586
2039	-	-	730,174	67,020,992	67,751,166
2040	-	-	662,047	64,746,918	65,408,965
2041	-	-	599,604	62,472,845	63,072,449
2042	-	-	541,414	60,198,771	60,740,185
2043	-	-	486,334	57,924,698	58,411,032
2044	-	-	433,909	55,650,625	56,084,534
2045	-	-	383,645	53,376,551	53,760,196
2046	-	-	334,558	51,102,478	51,437,036
2047	-	-	287,699	48,828,404	49,116,103
2048	-	-	245,494	46,554,331	46,799,825
2049	-	-	207,733	44,280,258	44,487,991
2050	-	-	173,690	42,006,184	42,179,874
2051	-	-	142,528	39,732,111	39,874,639
2052	-	-	114,491	37,458,037	37,572,528
2053	-	-	90,142	35,183,964	35,274,106
2054	-	-	69,942	-	69,942
2055	-	-	53,563	-	53,563
2056	-	-	40,061	-	40,061
2057	-	-	28,996	-	28,996
2058	-	-	20,533	-	20,533
2059	-	-	14,337	-	14,337
2060	-	-	9,924	-	9,924
2061	-	-	6,864	-	6,864
2062	-	-	4,746	-	4,746
2063	-	-	3,268	-	3,268
2064	-	-	2,231	-	2,231
2065	-	-	1,517	-	1,517
2066	-	-	1,040	-	1,040
2067	-	-	708	-	708

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

# Single Discount Rate Development

## Projection of Plan Fiduciary Net Position at 6.91%

### End of Year

Fiscal Year	Projected Beginning Plan Net Position	Projected Total Contributions	Projected Benefit Payments	Projected ASF Refund	Projected Administrative Expenses	Projected Investment Earnings at 6.91% (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)
2018	\$ 1,966,728,975	\$ 68,275,000	\$ 248,741,367	\$ 15,450,201	\$ 3,781,169	\$ 127,233,868	\$ 1,894,265,106
2019	1,894,265,106	68,275,000	247,145,340	15,450,201	3,484,253	122,448,659	1,818,908,971
2020	1,818,908,971	48,175,000	244,720,591	15,450,201	3,221,813	116,816,004	1,720,507,371
2021	1,720,507,371	48,275,000	242,024,297	15,450,201	3,001,997	110,293,653	1,618,599,529
2022	1,618,599,529	48,275,000	239,050,574	15,450,201	2,812,694	103,543,186	1,513,104,246
2023	1,513,104,246	48,275,000	236,021,160	15,450,201	2,646,152	96,555,600	1,403,817,333
2024	1,403,817,333	103,614,426	232,776,607	15,450,201	2,482,333	91,203,433	1,347,926,051
2025	1,347,926,051	101,178,362	229,584,098	15,450,201	2,320,342	87,586,967	1,289,336,739
2026	1,289,336,739	98,753,163	226,371,596	15,450,201	2,169,217	83,796,003	1,227,894,891
2027	1,227,894,891	96,328,103	222,512,269	15,450,201	2,018,230	79,841,752	1,164,084,046
2028	1,164,084,046	93,912,124	218,142,854	-	1,876,325	76,153,983	1,114,130,974
2029	1,114,130,974	91,504,845	213,343,507	-	1,743,119	72,788,016	1,063,337,208
2030	1,063,337,208	89,103,364	208,365,762	-	1,615,711	69,370,019	1,011,829,118
2031	1,011,829,118	86,706,573	203,030,763	-	1,492,994	65,914,798	959,926,732
2032	959,926,732	84,314,998	197,702,667	-	1,375,492	62,432,097	907,595,669
2033	907,595,669	81,928,055	191,948,618	-	1,262,623	58,934,246	855,246,729
2034	855,246,729	79,548,105	185,675,092	-	1,156,746	55,452,807	803,415,804
2035	803,415,804	77,176,215	179,089,542	-	1,058,930	52,017,764	752,461,311
2036	752,461,311	74,811,378	172,278,303	-	968,166	48,650,949	702,677,169
2037	702,677,169	72,451,938	165,281,649	-	882,799	45,371,305	654,335,963
2038	654,335,963	70,098,586	158,155,349	-	803,521	42,195,772	607,671,450
2039	607,671,450	67,751,166	150,672,089	-	730,174	39,148,225	563,168,578
2040	563,168,578	65,408,965	143,090,110	-	662,047	36,253,402	521,078,788
2041	521,078,788	63,072,449	135,475,368	-	599,604	33,526,435	481,602,700
2042	481,602,700	60,740,185	127,794,811	-	541,414	30,982,312	444,988,973
2043	444,988,973	58,411,032	120,146,892	-	486,334	28,634,868	411,401,648
2044	411,401,648	56,084,534	112,521,157	-	433,909	26,495,796	381,026,911
2045	381,026,911	53,760,196	104,943,182	-	383,645	24,577,091	354,037,371
2046	354,037,371	51,437,036	97,479,826	-	334,558	22,888,408	330,548,430
2047	330,548,430	49,116,103	90,209,007	-	287,699	21,435,077	310,602,904
2048	310,602,904	46,799,825	83,159,192	-	245,494	20,219,087	294,217,130
2049	294,217,130	44,487,991	76,380,305	-	207,733	19,239,871	281,356,953
2050	281,356,953	42,179,874	69,884,847	-	173,690	18,494,646	271,972,937
2051	271,972,937	39,874,639	63,698,226	-	142,528	17,979,131	265,985,953
2052	265,985,953	37,572,528	57,843,883	-	114,491	17,687,063	263,287,170
2053	263,287,170	35,274,106	52,336,787	-	90,142	17,610,412	263,744,759
2054	263,744,759	69,942	47,179,760	-	69,942	16,621,929	233,186,928
2055	233,186,928	53,563	42,373,815	-	53,563	14,673,654	205,486,767
2056	205,486,767	40,061	37,918,150	-	40,061	12,910,945	180,479,562
2057	180,479,562	28,996	33,808,624	-	28,996	11,322,560	157,993,498
2058	157,993,498	20,533	30,036,821	-	20,533	9,896,912	137,853,589
2059	137,853,589	14,337	26,591,303	-	14,337	8,622,299	119,884,585
2060	119,884,585	9,924	23,458,232	-	9,924	7,487,080	103,913,433
2061	103,913,433	6,864	20,622,091	-	6,864	6,479,826	89,771,167
2062	89,771,167	4,746	18,065,923	-	4,746	5,589,436	77,294,680
2063	77,294,680	3,268	15,771,925	-	3,268	4,805,244	66,327,999
2064	66,327,999	2,231	13,721,773	-	2,231	4,117,096	56,723,322
2065	56,723,322	1,517	11,896,968	-	1,517	3,515,407	48,341,761
2066	48,341,761	1,040	10,279,057	-	1,040	2,991,206	41,053,910
2067	41,053,910	708	8,849,992	-	708	2,536,165	34,740,082

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

# Single Discount Rate Development

## Projection of Plan Fiduciary Net Position at 6.91%

### End of Year (Concluded)

Fiscal Year	Projected Beginning	Projected Total	Projected Benefit	Projected ASF	Projected	Projected	Projected
Ending	Plan Net Position	Contributions	Payments	Refund	Administrative	Investment	Ending Plan
June 30,					Expenses	Earnings at 6.91% (5.25% for ASF)	Net Position
	(a)	(b)	(c)	(d)	(e)	(f)	(g)=(a)+(b)-(c)-(d)-(e)+(f)
2068	\$ 34,740,082	\$ 475	\$ 7,592,454	\$ -	\$ 475	\$ 2,142,602	\$ 29,290,230
2069	29,290,230	311	6,490,027	-	311	1,803,470	24,603,673
2070	24,603,673	197	5,527,308	-	197	1,512,335	20,588,701
2071	20,588,701	121	4,689,866	-	121	1,263,351	17,162,186
2072	17,162,186	74	3,964,210	-	74	1,051,231	14,249,207
2073	14,249,207	45	3,337,863	-	45	871,223	11,782,567
2074	11,782,567	25	2,799,373	-	25	719,073	9,702,267
2075	9,702,267	12	2,338,258	-	12	590,989	7,954,998
2076	7,954,998	4	1,944,969	-	4	483,614	6,493,643
2077	6,493,643	1	1,610,860	-	1	393,985	5,276,768
2078	5,276,768	-	1,328,159	-	-	319,503	4,268,112
2079	4,268,112	-	1,089,965	-	-	257,897	3,436,044
2080	3,436,044	-	890,178	-	-	207,189	2,753,055
2081	2,753,055	-	723,421	-	-	165,659	2,195,294
2082	2,195,294	-	584,974	-	-	131,822	1,742,141
2083	1,742,141	-	470,692	-	-	104,391	1,375,840
2084	1,375,840	-	376,904	-	-	82,266	1,081,202
2085	1,081,202	-	300,366	-	-	64,507	845,343
2086	845,343	-	238,242	-	-	50,319	657,421
2087	657,421	-	188,066	-	-	39,039	508,393
2088	508,393	-	147,732	-	-	30,111	390,772
2089	390,772	-	115,459	-	-	23,080	298,392
2090	298,392	-	89,753	-	-	17,570	226,209
2091	226,209	-	69,363	-	-	13,275	170,121
2092	170,121	-	53,256	-	-	9,946	126,810
2093	126,810	-	40,586	-	-	7,384	93,608
2094	93,608	-	30,668	-	-	5,426	68,366
2095	68,366	-	22,952	-	-	3,944	49,359
2096	49,359	-	16,996	-	-	2,833	35,196
2097	35,196	-	12,438	-	-	2,010	24,768
2098	24,768	-	8,986	-	-	1,406	17,188
2099	17,188	-	6,403	-	-	970	11,755
2100	11,755	-	4,498	-	-	659	7,916
2101	7,916	-	3,112	-	-	441	5,245
2102	5,245	-	2,119	-	-	290	3,417
2103	3,417	-	1,419	-	-	188	2,185
2104	2,185	-	934	-	-	119	1,370
2105	1,370	-	603	-	-	74	841
2106	841	-	382	-	-	45	504
2107	504	-	236	-	-	27	295
2108	295	-	142	-	-	16	168
2109	168	-	83	-	-	9	93
2110	93	-	48	-	-	5	51
2111	51	-	26	-	-	3	27
2112	27	-	14	-	-	1	14
2113	14	-	8	-	-	1	6
2114	6	-	4	-	-	0	3
2115	3	-	2	-	-	0	1
2116	1	-	1	-	-	0	0
2117	0	-	-	-	-	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 at 6.91%

### End of Year (Excluding ASF)

Fiscal Year Ending June 30,	Projected Beginning Plan Net Position	Projected Benefit Payments	Funded Portion of Benefit Payments	Unfunded Portion of Benefit Payments	Present Value of Funded Benefit Payments using Expected Return Rate (v)	Present Value of Unfunded Benefit Payments using Municipal Bond Rate (vf)	Present Value of Benefit Payments using Single Discount Rate (sdr)
(a)	(b)	(c)	(d)	(e)	(f)=(d)*v^((a)-.5)	(g)=(e)*vf^((a)-.5)	(h)=((c)/(1+sdr))^((a)-.5)
2018	\$ 1,845,807,421	\$ 248,741,367	\$ 248,741,367	\$ -	\$ 240,568,550	\$ -	\$ 240,568,550
2019	1,782,845,751	247,145,340	247,145,340	-	223,575,871	-	223,575,871
2020	1,717,490,682	244,720,591	244,720,591	-	207,073,578	-	207,073,578
2021	1,629,615,202	242,024,297	242,024,297	-	191,555,583	-	191,555,583
2022	1,538,786,102	239,050,574	239,050,574	-	176,973,120	-	176,973,120
2023	1,444,951,195	236,021,160	236,021,160	-	163,436,904	-	163,436,904
2024	1,347,936,828	232,776,607	232,776,607	-	150,771,825	-	150,771,825
2025	1,304,962,400	229,584,098	229,584,098	-	139,092,698	-	139,092,698
2026	1,259,968,078	226,371,596	226,371,596	-	128,282,121	-	128,282,121
2027	1,212,834,957	222,512,269	222,512,269	-	117,945,081	-	117,945,081
2028	1,164,084,046	218,142,854	218,142,854	-	108,155,481	-	108,155,481
2029	1,114,130,974	213,343,507	213,343,507	-	98,939,256	-	98,939,256
2030	1,063,337,208	208,365,762	208,365,762	-	90,385,182	-	90,385,182
2031	1,011,829,118	203,030,763	203,030,763	-	82,378,598	-	82,378,598
2032	959,926,732	197,702,667	197,702,667	-	75,032,039	-	75,032,039
2033	907,595,669	191,948,618	191,948,618	-	68,139,804	-	68,139,804
2034	855,246,729	185,675,092	185,675,092	-	61,652,573	-	61,652,573
2035	803,415,804	179,089,542	179,089,542	-	55,622,366	-	55,622,366
2036	752,461,311	172,278,303	172,278,303	-	50,048,549	-	50,048,549
2037	702,677,169	165,281,649	165,281,649	-	44,912,498	-	44,912,498
2038	654,335,963	158,155,349	158,155,349	-	40,198,341	-	40,198,341
2039	607,671,450	150,672,089	150,672,089	-	35,821,084	-	35,821,084
2040	563,168,578	143,090,110	143,090,110	-	31,819,782	-	31,819,782
2041	521,078,788	135,475,368	135,475,368	-	28,179,261	-	28,179,261
2042	481,602,700	127,794,811	127,794,811	-	24,863,608	-	24,863,608
2043	444,988,973	120,146,892	120,146,892	-	21,864,781	-	21,864,781
2044	411,401,648	112,521,157	112,521,157	-	19,153,514	-	19,153,514
2045	381,026,911	104,943,182	104,943,182	-	16,708,989	-	16,708,989
2046	354,037,371	97,479,826	97,479,826	-	14,517,517	-	14,517,517
2047	330,548,430	90,209,007	90,209,007	-	12,566,351	-	12,566,351
2048	310,602,904	83,159,192	83,159,192	-	10,835,556	-	10,835,556
2049	294,217,130	76,380,305	76,380,305	-	9,309,021	-	9,309,021
2050	281,356,953	69,884,847	69,884,847	-	7,966,862	-	7,966,862
2051	271,972,937	63,698,226	63,698,226	-	6,792,244	-	6,792,244
2052	265,985,953	57,843,883	57,843,883	-	5,769,326	-	5,769,326
2053	263,287,170	52,336,787	52,336,787	-	4,882,659	-	4,882,659
2054	263,744,759	47,179,760	47,179,760	-	4,117,055	-	4,117,055
2055	233,186,928	42,373,815	42,373,815	-	3,458,679	-	3,458,679
2056	205,486,767	37,918,150	37,918,150	-	2,894,953	-	2,894,953
2057	180,479,562	33,808,624	33,808,624	-	2,414,368	-	2,414,368
2058	157,993,498	30,036,821	30,036,821	-	2,006,373	-	2,006,373
2059	137,853,589	26,591,303	26,591,303	-	1,661,418	-	1,661,418
2060	119,884,585	23,458,232	23,458,232	-	1,370,933	-	1,370,933
2061	103,913,433	20,622,091	20,622,091	-	1,127,289	-	1,127,289
2062	89,771,167	18,065,923	18,065,923	-	923,729	-	923,729
2063	77,294,680	15,771,925	15,771,925	-	754,311	-	754,311
2064	66,327,999	13,721,773	13,721,773	-	613,844	-	613,844
2065	56,723,322	11,896,968	11,896,968	-	497,812	-	497,812
2066	48,341,761	10,279,057	10,279,057	-	402,313	-	402,313
2067	41,053,910	8,849,992	8,849,992	-	323,993	-	323,993



# Single Discount Rate Development

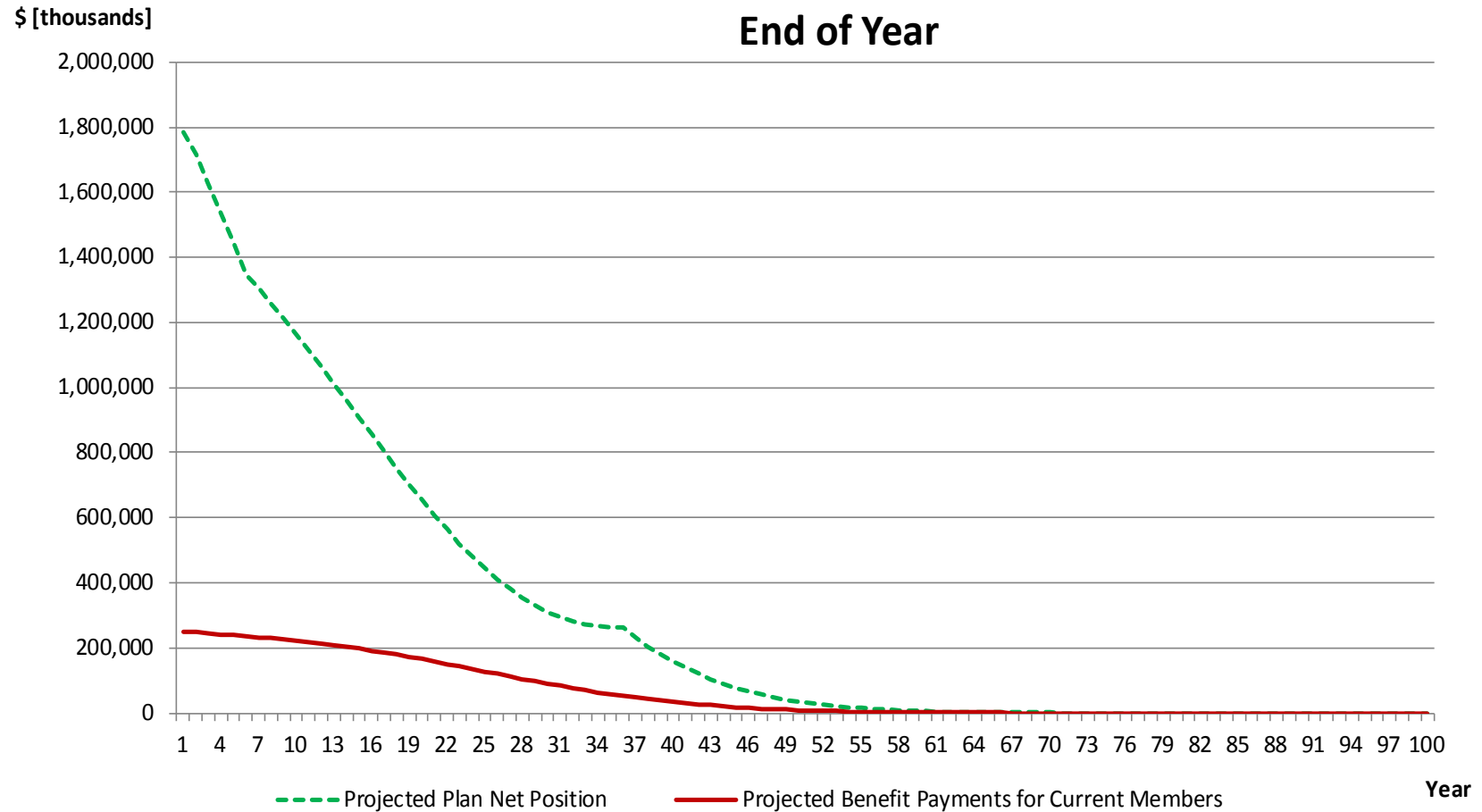
## Present Values of Projected Benefits at 6.91%

### 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	Projected Benefit	Funded Portion of	of Benefit	Funded Benefit	Unfunded Benefit	Benefit
	Position	Payments	Benefit Payments	Payments	Payments using Expected Return Rate (v)	Payments using Municipal Bond Rate (vf)	Payments using Single Discount Rate (sdr)
(a)	(b)	(c)	(d)	(e)	(f)=(d)*v^((a)-.5)	(g)=(e)*vf ^((a)-.5)	(h)=((c)/(1+sdr)^(a-.5)
2068	\$ 34,740,082	\$ 7,592,454	\$ 7,592,454	\$ -	\$ 259,990	\$ -	\$ 259,990
2069	29,290,230	6,490,027	6,490,027	-	207,875	-	207,875
2070	24,603,673	5,527,308	5,527,308	-	165,597	-	165,597
2071	20,588,701	4,689,866	4,689,866	-	131,426	-	131,426
2072	17,162,186	3,964,210	3,964,210	-	103,910	-	103,910
2073	14,249,207	3,337,863	3,337,863	-	81,837	-	81,837
2074	11,782,567	2,799,373	2,799,373	-	64,199	-	64,199
2075	9,702,267	2,338,258	2,338,258	-	50,158	-	50,158
2076	7,954,998	1,944,969	1,944,969	-	39,025	-	39,025
2077	6,493,643	1,610,860	1,610,860	-	30,232	-	30,232
2078	5,276,768	1,328,159	1,328,159	-	23,315	-	23,315
2079	4,268,112	1,089,965	1,089,965	-	17,897	-	17,897
2080	3,436,044	890,178	890,178	-	13,672	-	13,672
2081	2,753,055	723,421	723,421	-	10,393	-	10,393
2082	2,195,294	584,974	584,974	-	7,861	-	7,861
2083	1,742,141	470,692	470,692	-	5,916	-	5,916
2084	1,375,840	376,904	376,904	-	4,431	-	4,431
2085	1,081,202	300,366	300,366	-	3,303	-	3,303
2086	845,343	238,242	238,242	-	2,451	-	2,451
2087	657,421	188,066	188,066	-	1,809	-	1,809
2088	508,393	147,732	147,732	-	1,329	-	1,329
2089	390,772	115,459	115,459	-	972	-	972
2090	298,392	89,753	89,753	-	707	-	707
2091	226,209	69,363	69,363	-	511	-	511
2092	170,121	53,256	53,256	-	367	-	367
2093	126,810	40,586	40,586	-	262	-	262
2094	93,608	30,668	30,668	-	185	-	185
2095	68,366	22,952	22,952	-	129	-	129
2096	49,359	16,996	16,996	-	90	-	90
2097	35,196	12,438	12,438	-	61	-	61
2098	24,768	8,986	8,986	-	41	-	41
2099	17,188	6,403	6,403	-	28	-	28
2100	11,755	4,498	4,498	-	18	-	18
2101	7,916	3,112	3,112	-	12	-	12
2102	5,245	2,119	2,119	-	7	-	7
2103	3,417	1,419	1,419	-	5	-	5
2104	2,185	934	934	-	3	-	3
2105	1,370	603	603	-	2	-	2
2106	841	382	382	-	1	-	1
2107	504	236	236	-	1	-	1
2108	295	142	142	-	0	-	0
2109	168	83	83	-	0	-	0
2110	93	48	48	-	0	-	0
2111	51	26	26	-	0	-	0
2112	27	14	14	-	0	-	0
2113	14	8	8	-	0	-	0
2114	6	4	4	-	0	-	0
2115	3	2	2	-	0	-	0
2116	1	1	1	-	0	-	0
2117	0	-	-	-	-	-	-
<b>Totals</b>					<b>\$ 2,789,587,672</b>	<b>\$ -</b>	<b>\$ 2,789,587,672</b>

## Projection of Plan Net Position and Benefit Payments at 6.91% End of Year



## SECTION F

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### GLOSSARY OF TERMS

## Glossary of Terms

<b><i>Actuarial Accrued Liability (AAL)</i></b>	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."
<b><i>Actuarial Assumptions</i></b>	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.
<b><i>Accrued Service</i></b>	Service credited under the system which was rendered before the date of the actuarial valuation.
<b><i>Actuarial Equivalent</i></b>	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.
<b><i>Actuarial Cost Method</i></b>	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.
<b><i>Actuarial Gain (Loss)</i></b>	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.
<b><i>Actuarial Present Value (APV)</i></b>	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.
<b><i>Actuarial Valuation</i></b>	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.
<b><i>Actuarial Valuation Date</i></b>	The date as of which an actuarial valuation is performed.
<b><i>Actuarially Determined Contribution (ADC) or Annual Required Contribution (ARC)</i></b>	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

<b><i>Actuarial Accrued Liability (AAL)</i></b>	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."
<b><i>Actuarial Assumptions</i></b>	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.
<b><i>Accrued Service</i></b>	Service credited under the system which was rendered before the date of the actuarial valuation.
<b><i>Actuarial Equivalent</i></b>	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.
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<b><i>Actuarial Valuation Date</i></b>	The date as of which an actuarial valuation is performed.
<b><i>Actuarially Determined Contribution (ADC) or Annual Required Contribution (ARC)</i></b>	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

<b><i>Amortization Payment</i></b>	The amortization payment is the periodic payment required to pay off an interest-discounted amount with payments of interest and principal.
<b><i>Amortization Method</i></b>	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).
<b><i>Cost-of-Living Adjustments</i></b>	Postemployment benefit changes intended to adjust benefit payments for the effects of inflation.
<b><i>Cost-Sharing Multiple-Employer Defined Benefit Pension Plan (cost-sharing pension plan)</i></b>	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.
<b><i>Covered-Employee Payroll</i></b>	The payroll of covered employees, which is typically only the pensionable pay and does not include pay above any pay cap.
<b><i>Deferred Inflows and Outflows</i></b>	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.
<b><i>Discount Rate</i></b>	<p>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:</p> <ol style="list-style-type: none"><li>1. The benefit payments to be made while the pension plans’ fiduciary net position is projected to be greater than the benefit payments that are projected to be made in the period; and</li><li>2. The present value of the benefit payments not in (1) above, discounted using the municipal bond rate.</li></ol>

## Glossary of Terms

<b><i>Entry Age Actuarial Cost Method (EAN)</i></b>	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.
<b><i>GASB</i></b>	The Governmental Accounting Standards Board is an organization that exists in order to promulgate accounting standards for governmental entities.
<b><i>Fiduciary Net Position</i></b>	The fiduciary net position is the value of the assets of the trust.
<b><i>Long-Term Expected Rate of Return</i></b>	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.
<b><i>Money-Weighted Rate of Return</i></b>	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.
<b><i>Multiple-Employer Defined Benefit Pension Plan</i></b>	A multiple-employer plan is a defined benefit pension plan that is used to provide pensions to the employees of more than one employer.
<b><i>Municipal Bond Rate</i></b>	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.
<b><i>Net Pension Liability (NPL)</i></b>	The NPL is the liability of employers and non-employer contribution entities to plan members for benefits provided through a defined benefit pension plan.
<b><i>Non-Employer Contribution Entities</i></b>	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.
<b><i>Normal Cost</i></b>	The actuarial present value of the pension trust benefits allocated to the current year by the actuarial cost method. Also known as service cost.

# 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, 2018





October 31, 2018

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, 2017. The total pension liability was rolled-forward from the valuation date to the plan year ending June 30, 2018 using generally accepted actuarial principles. The asset information as of June 30, 2018 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, 2018, up from 6.91%, net of investment expenses, as of June 30, 2017. We have reviewed this assumption based on the System's asset allocation and have determined it is not unreasonable 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, 2018. 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.

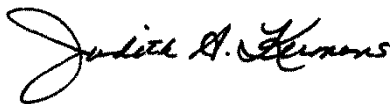
The signing individuals are independent of the plan sponsor.

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.

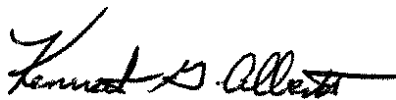
Respectfully submitted,



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



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



Kenneth G. Alberts  
Consultant

DTK/JAK/KGA:ah



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# SECTION A

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## EXECUTIVE SUMMARY

# Executive Summary as of June 30, 2018

Actuarial Valuation Date	June 30, 2017
Measurement Date of the Net Pension Liability	June 30, 2018
Employer's Fiscal Year Ending Date (Reporting Date)	June 30, 2019

## Membership

Number of	
- Retirees and Beneficiaries	11,834
- Inactive, Nonretired Members	3,355
- Active Members	3,025
- Total	18,214
Covered Payroll	\$ 141,454,717

## Net Pension Liability

Total Pension Liability	\$ 2,773,306,153
Plan Fiduciary Net Position	1,940,623,642
Net Pension Liability	\$ 832,682,511
Plan Fiduciary Net Position as a Percentage of Total Pension Liability	69.98%
Net Pension Liability as a Percentage of Covered Payroll	588.66%

## 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*	3.62%
Last year ending June 30 in the 2019 to 2118 projection period for which projected benefit payments are fully funded	2118

<b>Total Pension Expense</b>	<b>\$ (21,468,726)</b>
------------------------------	------------------------

## 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	75,706,005	64,663,887
Total	\$ 75,706,005	\$ 64,663,887

\*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 29, 2018. 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

For purposes of determining the total pension liability as of June 30, 2018, the following actuarial assumptions were changed/modified from those used in the June 30, 2017 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, 2018 (it was 6.75% net of investment and administrative expenses, in the June 30, 2017 funding valuation, as required by the Plan of Adjustment).
- The June 30, 2017 funding valuation included approximately \$5.9 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 2017 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.

All other actuarial assumptions were the same as those used in the June 30, 2017 actuarial valuation (the funding valuation).

The following assumptions were changed/modified from those used in the June 30, 2017 GASB Statement Nos. 67 and 68 valuations:

- The Single Discount Rate (SDR) changed to 7.38% from 6.91% (coincident with the change in the long-term expected return). While this assumption is not unreasonable, it is important to note that the direction and magnitude of the change is not consistent with the industry trend.

## 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 making this report are included in the June 30, 2017 funding valuation report.

## Magnitude of Administrative Expenses

The Component I (Hybrid) payroll has significantly increased since the last valuation. As a result, for this valuation, we have adjusted the administrative expense as a percent of payroll assumption to bring the assumption in line with current experience. This brought the expenses as a percent of Component I payroll down from 3.55% back to the previous assumption of 3.0%. In addition, 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.

## 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, 2017.

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.

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.



## 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, 2017, rolled to the plan year end of June 30, 2018.

## 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 (which is published by the Federal Reserve) 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 3.62% (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.

## 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 (69.98% as of June 30, 2018). 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, 2018 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, 2017 in accordance with GAAP accounting.

## SECTION B

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### 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, 2018

## Assets

Cash and Cash Equivalents	\$ 179,460,709
Receivables	111,876,197
Investments at Fair Value	1,668,833,586
Cash and Investments held as collateral for securities lending	80,544,567
Capital Assets - Net	<u>550,318</u>
<b>Total Assets</b>	<u><b>\$ 2,041,265,377</b></u>

## Liabilities

Accounts Payable	<u>\$ 100,641,735</u>
<b>Total Liabilities</b>	<u><b>\$ 100,641,735</b></u>

<b>Net Position Restricted for Pensions</b>	<u><b>\$ 1,940,623,642</b></u>
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<b>ASF Reserve</b>	\$ 108,420,640
<b>Other Reserves</b>	<u>1,832,203,002</u>
<b>Plan Fiduciary Net Position</b>	<u><b>\$ 1,940,623,642</b></u>

# Statement of Changes in Fiduciary Net Position for Year Ended June 30, 2018

## Additions

### Contributions

Employer	\$ 68,275,000
Employee	-
Other	-
<b>Total Contributions</b>	<u>\$ 68,275,000</u>

### Investment Income

Investment Income	<u>\$ 155,423,193</u>
<b>Net Investment Income</b>	<u>\$ 155,423,193</u>

### Other Income (Including ASF Interest)^

	<u>\$ 7,859,047</u>
<b>Total Additions</b>	<u>\$ 231,557,240</u>

## Deductions

Benefit Payments, including Refunds of Employee Contributions	\$ 253,442,630
Pension Plan Administrative Expense	3,313,418
Other	<u>906,525</u>
<b>Total Deductions</b>	<u>\$ 257,662,573</u>

<b>Net Increase in Net Position</b>	\$ (26,105,333)
-------------------------------------	-----------------

## Net Position Restricted for Pensions

Beginning of Year	<u>\$ 1,966,728,975</u>
End of Year	<u><u>\$ 1,940,623,642</u></u>

<sup>^</sup> 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, 2018\*

<b>A. Expense</b>	<b>General</b>	<b>DOT</b>	<b>DWSD</b>	<b>Library</b>	<b>Total</b>
1. Service Cost	\$ -	\$ -	\$ -	\$ -	\$ -
2. Interest on the Total Pension Liability	105,690,910	28,026,537	52,030,052	6,612,246	192,359,745
3. Current-Period Benefit Changes	-	-	-	-	-
4. Employee Contributions (made negative for addition here)	-	-	-	-	-
5. Projected Earnings on Plan Investments (made negative for addition here)	(73,509,440)	(14,554,264)	(35,989,658)	(5,575,800)	(129,629,162)
6. Pension Plan Administrative Expense	2,787,861	385,145	-	140,412	3,313,418
7. Other Changes in Plan Fiduciary Net Position	(3,632,647)	(1,191,567)	(1,971,590)	(156,718)	(6,952,522)
8. Recognition of Outflow (Inflow) of Resources due to Liabilities	(56,122,083)	15,337,263	(30,819,300)	(4,516,068)	(76,120,188)
9. Recognition of Outflow (Inflow) of Resources due to Assets	5,382,006	(840,727)	(7,116,332)	(1,864,964)	(4,440,017)
<b>10. Total Pension Expense</b>	<b>\$ (19,403,393)</b>	<b>\$ 27,162,387</b>	<b>\$ (23,866,828)</b>	<b>\$ (5,360,892)</b>	<b>\$ (21,468,726)</b>

\*Totals may not add due to rounding.

# Statement of Outflows and Inflows Arising from Current Reporting Period Fiscal Year Ended June 30, 2018\*

## A. Outflows (Inflows) of Resources due to Liabilities

	General	DOT	DWSD	Library	Total
1. Difference between expected and actual experience of the Total Pension Liability (gains) or losses	\$ 3,041,504	\$ 32,573,900	\$ (456,059)	\$ (1,005,018)	\$ 34,154,327
2. Assumption Changes (gains) or losses	\$ (59,163,587)	\$ (17,236,637)	\$ (30,363,241)	\$ (3,511,050)	\$ (110,274,515)
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	\$ 3,041,504	\$ 32,573,900	\$ (456,059)	\$ (1,005,018)	\$ 34,154,327
5. Outflow (Inflow) of Resources to be recognized in the current pension expense for Assumption Changes	\$ (59,163,587)	\$ (17,236,637)	\$ (30,363,241)	\$ (3,511,050)	\$ (110,274,515)
6. Outflow (Inflow) of Resources to be recognized in the current pension expense due to Liabilities	\$ (56,122,083)	\$ 15,337,263	\$ (30,819,300)	\$ (4,516,068)	\$ (76,120,188)
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	\$ (15,759,553)	\$ (2,082,160)	\$ (7,178,439)	\$ (773,879)	\$ (25,794,031)
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	\$ (3,151,911)	\$ (416,432)	\$ (1,435,688)	\$ (154,776)	\$ (5,158,806)
4. Deferred Outflow (Inflow) of Resources to be recognized in future pension expenses due to Assets	\$ (12,607,642)	\$ (1,665,728)	\$ (5,742,751)	\$ (619,103)	\$ (20,635,225)

\*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	\$ 3,041,504	\$ 59,163,587	\$ (56,122,083)
2. Due to Assets	\$ 24,951,060	19,569,054	5,382,006
<b>3. Total</b>	<b>\$ 27,992,564</b>	<b>\$ 78,732,641</b>	<b>\$ (50,740,077)</b>

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

	Outflows of Resources	Inflows of Resources	Net Outflows of Resources
1. Differences between expected and actual experience	\$ 3,041,504	\$ -	\$ 3,041,504
2. Assumption Changes	-	\$ 59,163,587	(59,163,587)
3. Net Difference between projected and actual earnings on pension plan investments	\$ 24,951,060	19,569,054	5,382,006
<b>4. Total</b>	<b>\$ 27,992,564</b>	<b>\$ 78,732,641</b>	<b>\$ (50,740,077)</b>

## 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	\$ 43,864,047	38,443,393	5,420,654
<b>4. Total</b>	<b>\$ 43,864,047</b>	<b>\$ 38,443,393</b>	<b>\$ 5,420,654</b>

## 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
2019	\$ 13,187,234
2020	7,149,157
2021	(11,763,828)
2022	(3,151,909)
2023	-
Thereafter	-
<b>Total</b>	<b>\$ 5,420,654</b>



# Recognition of Deferred Outflows and Inflows of Resources

## Fiscal Year Ended June 30, 2018

### General

Year Established	Initial Amount	Initial Recognition Period	Current Year Recognition	Remaining Recognition	Remaining Recognition Period
<b>Deferred Outflow (Inflow) due to Differences Between Expected and Actual Experience on Liabilities</b>					
2014	0	1.8529	0	0	0.0000
2015	18,703,738	1.0000	0	0	0.0000
2016	(29,429,615)	1.0000	0	0	0.0000
2017	(23,006,975)	1.0000	0	0	0.0000
2018	3,041,504	1.0000	3,041,504	0	0.0000
<b>Total</b>			<b>3,041,504</b>	<b>0</b>	
<b>Deferred Outflow (Inflow) due to Assumption Changes</b>					
2014	(151,154,952)	1.8529	0	0	0.0000
2015	(55,704,947)	1.0000	0	0	0.0000
2016	49,169,719	1.0000	0	0	0.0000
2017	41,844,061	1.0000	0	0	0.0000
2018	(59,163,587)	1.0000	(59,163,587)	0	0.0000
<b>Total</b>			<b>(59,163,587)</b>	<b>0</b>	
<b>Deferred Outflow (Inflow) due to Differences Between Projected and Actual Earnings on Plan Investments</b>					
2014	(39,026,134)	5.0000	(7,805,226)	0	0.0000
2015	30,190,382	5.0000	6,038,076	6,038,078	1.0000
2016	94,564,921	5.0000	18,912,984	37,825,969	2.0000
2017	(43,059,585)	5.0000	(8,611,917)	(25,835,751)	3.0000
2018	(15,759,553)	5.0000	(3,151,911)	(12,607,642)	4.0000
<b>Total</b>			<b>5,382,006</b>	<b>5,420,654</b>	

# 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	\$ 32,573,900	\$ 17,236,637	\$ 15,337,263
2. Due to Assets	\$ 5,162,784	6,003,511	(840,727)
<b>3. Total</b>	<b>\$ 37,736,684</b>	<b>\$ 23,240,148</b>	<b>\$ 14,496,536</b>

## 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	\$ 32,573,900	\$ -	\$ 32,573,900
2. Assumption Changes	-	\$ 17,236,637	(17,236,637)
3. Net Difference between projected and actual earnings on pension plan investments	\$ 5,162,784	6,003,511	(840,727)
<b>4. Total</b>	<b>\$ 37,736,684</b>	<b>\$ 23,240,148</b>	<b>\$ 14,496,536</b>

## 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	\$ 8,995,948	6,388,624	2,607,324
<b>4. Total</b>	<b>\$ 8,995,948</b>	<b>\$ 6,388,624</b>	<b>\$ 2,607,324</b>

## 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
2019	\$ 3,172,052
2020	1,842,434
2021	(1,990,730)
2022	(416,432)
2023	-
Thereafter	-
<b>Total</b>	<b>\$ 2,607,324</b>

# Recognition of Deferred Outflows and Inflows of Resources

## Fiscal Year Ended June 30, 2018

### DOT

Year Established	Initial Amount	Initial Recognition Period	Current Year Recognition	Remaining Recognition	Remaining Recognition Period
<b>Deferred Outflow (Inflow) due to Differences Between Expected and Actual Experience on Liabilities</b>					
2014	0	2.1831	0	0	0.0000
2015	12,036,135	1.0000	0	0	0.0000
2016	(3,435,546)	1.0000	0	0	0.0000
2017	(5,802,247)	1.0000	0	0	0.0000
2018	32,573,900	1.0000	32,573,900	0	0.0000
<b>Total</b>			<b>32,573,900</b>	<b>0</b>	
<b>Deferred Outflow (Inflow) due to Assumption Changes</b>					
2014	(34,363,784)	2.1831	0	0	0.0000
2015	(14,340,139)	1.0000	0	0	0.0000
2016	12,849,218	1.0000	0	0	0.0000
2017	11,022,689	1.0000	0	0	0.0000
2018	(17,236,637)	1.0000	(17,236,637)	0	0.0000
<b>Total</b>			<b>(17,236,637)</b>	<b>0</b>	
<b>Deferred Outflow (Inflow) due to Differences Between Projected and Actual Earnings on Plan Investments</b>					
2014	(20,063,892)	5.0000	(4,012,780)	0	0.0000
2015	6,648,084	5.0000	1,329,617	1,329,616	1.0000
2016	19,165,833	5.0000	3,833,167	7,666,332	2.0000
2017	(7,871,494)	5.0000	(1,574,299)	(4,722,896)	3.0000
2018	(2,082,160)	5.0000	(416,432)	(1,665,728)	4.0000
<b>Total</b>			<b>(840,727)</b>	<b>2,607,324</b>	

# 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	\$ -	\$ 30,819,300	\$ (30,819,300)
2. Due to Assets	\$ 11,292,804	18,409,136	(7,116,332)
<b>3. Total</b>	<b>\$ 11,292,804</b>	<b>\$ 49,228,436</b>	<b>\$ (37,935,632)</b>

## 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	\$ -	\$ 456,059	\$ (456,059)
2. Assumption Changes	-	30,363,241	(30,363,241)
3. Net Difference between projected and actual earnings on pension plan investments	\$ 11,292,804	18,409,136	(7,116,332)
<b>4. Total</b>	<b>\$ 11,292,804</b>	<b>\$ 49,228,436</b>	<b>\$ (37,935,632)</b>

## 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	\$ 19,798,146	17,581,095	2,217,051
<b>4. Total</b>	<b>\$ 19,798,146</b>	<b>\$ 17,581,095</b>	<b>\$ 2,217,051</b>

## 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
2019	\$ 5,911,001
2020	3,123,539
2021	(5,381,802)
2022	(1,435,687)
2023	-
Thereafter	-
<b>Total</b>	<b>\$ 2,217,051</b>

# Recognition of Deferred Outflows and Inflows of Resources

## Fiscal Year Ended June 30, 2018

### DWSD

Year Established	Initial Amount	Initial Recognition Period	Current Year Recognition	Remaining Recognition	Remaining Recognition Period
<b>Deferred Outflow (Inflow) due to Differences Between Expected and Actual Experience on Liabilities</b>					
2014	0	2.8654	0	0	0.0000
2015	(607,587)	1.0000	0	0	0.0000
2016	(7,203,304)	1.0000	0	0	0.0000
2017	3,370,105	1.0000	0	0	0.0000
2018	(456,059)	1.0000	(456,059)	0	0.0000
<b>Total</b>			<b>(456,059)</b>	<b>0</b>	
<b>Deferred Outflow (Inflow) due to Assumption Changes</b>					
2014	(74,737,651)	2.8654	0	0	0.0000
2015	(28,150,723)	1.0000	0	0	0.0000
2016	25,074,531	1.0000	0	0	0.0000
2017	21,554,914	1.0000	0	0	0.0000
2018	(30,363,241)	1.0000	(30,363,241)	0	0.0000
<b>Total</b>			<b>(30,363,241)</b>	<b>0</b>	
<b>Deferred Outflow (Inflow) due to Differences Between Projected and Actual Earnings on Plan Investments</b>					
2014	(65,136,661)	5.0000	(13,027,333)	0	0.0000
2015	13,937,310	5.0000	2,787,462	2,787,462	1.0000
2016	42,526,710	5.0000	8,505,342	17,010,684	2.0000
2017	(19,730,574)	5.0000	(3,946,115)	(11,838,344)	3.0000
2018	(7,178,439)	5.0000	(1,435,688)	(5,742,751)	4.0000
<b>Total</b>			<b>(7,116,332)</b>	<b>2,217,051</b>	

# 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	\$ -	\$ 4,516,068	\$ (4,516,068)
2. Due to Assets	\$ 1,733,209	\$ 3,598,173	\$ (1,864,964)
<b>3. Total</b>	<b>\$ 1,733,209</b>	<b>\$ 8,114,241</b>	<b>\$ (6,381,032)</b>

## 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	\$ -	\$ 1,005,018	\$ (1,005,018)
2. Assumption Changes	-	3,511,050	(3,511,050)
3. Net Difference between projected and actual earnings on pension plan investments	\$ 1,733,209	\$ 3,598,173	\$ (1,864,964)
<b>4. Total</b>	<b>\$ 1,733,209</b>	<b>\$ 8,114,241</b>	<b>\$ (6,381,032)</b>

## 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	\$ 3,047,864	\$ 2,250,775	\$ 797,089
<b>4. Total</b>	<b>\$ 3,047,864</b>	<b>\$ 2,250,775</b>	<b>\$ 797,089</b>

## 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
2019	\$ 1,034,542
2020	615,988
2021	(698,666)
2022	(154,775)
2023	-
Thereafter	-
<b>Total</b>	<b>\$ 797,089</b>

# Recognition of Deferred Outflows and Inflows of Resources

## Fiscal Year Ended June 30, 2018

### Library

Year Established	Initial Amount	Initial Recognition Period	Current Year Recognition	Remaining Recognition	Remaining Recognition Period
<b>Deferred Outflow (Inflow) due to Differences Between Expected and Actual Experience on Liabilities</b>					
2014	0	3.7901	0	0	0.0000
2015	(5,487,755)	1.0000	0	0	0.0000
2016	(3,650,647)	1.0000	0	0	0.0000
2017	(2,069,263)	1.0000	0	0	0.0000
2018	(1,005,018)	1.0000	(1,005,018)	0	0.0000
<b>Total</b>			<b>(1,005,018)</b>	<b>0</b>	
<b>Deferred Outflow (Inflow) due to Assumption Changes</b>					
2014	(10,933,807)	3.7901	0	0	0.0000
2015	(3,364,084)	1.0000	0	0	0.0000
2016	2,941,459	1.0000	0	0	0.0000
2017	2,504,293	1.0000	0	0	0.0000
2018	(3,511,050)	1.0000	(3,511,050)	0	0.0000
<b>Total</b>			<b>(3,511,050)</b>	<b>0</b>	
<b>Deferred Outflow (Inflow) due to Differences Between Projected and Actual Earnings on Plan Investments</b>					
2014	(14,497,530)	5.0000	(2,899,506)	0	0.0000
2015	2,092,765	5.0000	418,553	418,553	1.0000
2016	6,573,279	5.0000	1,314,656	2,629,311	2.0000
2017	(2,719,454)	5.0000	(543,891)	(1,631,672)	3.0000
2018	(773,879)	5.0000	(154,776)	(619,103)	4.0000
<b>Total</b>			<b>(1,864,964)</b>	<b>797,089</b>	

# 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	\$ 35,615,404	\$ 111,735,592	\$ (76,120,188)
2. Due to Assets	\$ 43,139,857	47,579,874	(4,440,017)
<b>3. Total</b>	<b>\$ 78,755,261</b>	<b>\$ 159,315,466</b>	<b>\$ (80,560,205)</b>

## 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	\$ 35,615,404	\$ 1,461,077	\$ 34,154,327
2. Assumption Changes	-	110,274,515	(110,274,515)
3. Net Difference between projected and actual earnings on pension plan investments	\$ 43,139,857	47,579,874	(4,440,017)
<b>4. Total</b>	<b>\$ 78,755,261</b>	<b>\$ 159,315,466</b>	<b>\$ (80,560,205)</b>

## 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	\$ 75,706,005	64,663,887	11,042,118
<b>4. Total</b>	<b>\$ 75,706,005</b>	<b>\$ 64,663,887</b>	<b>\$ 11,042,118</b>

## 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
2019	\$ 23,304,829
2020	12,731,118
2021	(19,835,026)
2022	(5,158,803)
2023	-
Thereafter	-
<b>Total</b>	<b>\$ 11,042,118</b>



# Schedule of Proportionate Employer Share for Year Ended June 30, 2018 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
\$ 1,484,157,951	General City	98.39%	\$ 407,549,164	\$ -	\$ 43,157,836	\$ -	\$ -	\$ 43,157,836
21,118,215	Parking	1.40%	5,799,053	-	614,097	-	-	614,097
3,167,732	Airport	0.21%	869,858	-	92,114	-	-	92,114
<b>\$ 1,508,443,898</b>	<b>Total for All Employers</b>	<b>100.00%</b>	<b>\$ 414,218,075</b>	<b>\$ -</b>	<b>\$ 43,864,047</b>	<b>\$ -</b>	<b>\$ -</b>	<b>\$ 43,864,047</b>

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 Contributions and Proportionate	Total Employer Pension Expense
General City	\$ -	\$ 37,824,454	\$ -	\$ -	\$ 37,824,454	\$ (19,090,998)	\$ 686,556	\$ (18,404,442)
Parking	-	538,208	-	-	538,208	(271,648)	(478,730)	(750,378)
Airport	-	80,731	-	-	80,731	(40,747)	(207,826)	(248,573)
<b>Total for All Employers</b>	<b>\$ -</b>	<b>\$ 38,443,393</b>	<b>\$ -</b>	<b>\$ -</b>	<b>\$ 38,443,393</b>	<b>\$ (19,403,393)</b>	<b>\$ -</b>	<b>\$ (19,403,393)</b>

\* Totals may not add due to rounding.

## Schedule of Proportionate Employer Share for Year Ended June 30, 2018 General Subgroup\*

Employer	Employer Allocation Percentage	Schedule of Deferred Inflows and Outflows						
		2019	2020	2021	2022	2023	Thereafter	Total
General City	98.39%	\$ 12,974,920	\$ 7,034,056	\$(11,574,430)	\$ (3,101,163)	\$ -	\$ -	\$ 5,333,381
Parking	1.40%	184,621	100,088	(164,694)	(44,127)	-	-	75,889
Airport	0.21%	27,693	15,013	(24,704)	(6,619)	-	-	11,383
<b>TOTAL</b>	<b>100.00%</b>	<b>\$ 13,187,234</b>	<b>\$ 7,149,157</b>	<b>\$(11,763,828)</b>	<b>\$ (3,151,909)</b>	<b>\$ -</b>	<b>\$ -</b>	<b>\$ 5,420,654</b>

\* Totals may not add due to rounding.

## Determination of Employer Contribution Allocation for Year Ended June 30, 2018

Employer	General City	Parking	Airport	General Total	DOT	DWSD	Library	Total
Contributions Before General Breakdown				\$22,764,999	\$110,001	\$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	\$22,764,999	\$22,764,999	\$22,764,999	\$22,764,999	N/A	N/A	N/A	N/A
Contribution Allocation Dollar	\$22,764,999	\$ 0	\$ 0	\$22,764,999	\$110,001	\$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

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### REQUIRED SUPPLEMENTARY INFORMATION

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

## Fiscal Year Ended June 30, 2018\*

<b>A. Total Pension Liability</b>	<b>General</b>	<b>DOT</b>	<b>DWSD</b>	<b>Library</b>	<b>Total</b>
1. Service Cost	\$ -	\$ -	\$ -	\$ -	\$ -
2. Interest on the Total Pension Liability	105,690,910	28,026,537	52,030,052	6,612,246	192,359,745
3. Changes of benefit terms	-	-	-	-	-
4. Difference between expected and actual experience of the Total Pension Liability	3,041,504	32,573,900	(456,059)	(1,005,018)	34,154,327
5. Changes of assumptions	(59,163,587)	(17,236,637)	(30,363,241)	(3,511,050)	(110,274,515)
6. Benefit payments, including refunds of employee contributions ^	(141,321,034)	(36,880,997)	(67,419,972)	(7,820,627)	(253,442,630)
7. Net change in Total Pension Liability	\$ (91,752,207)	\$ 6,482,803	\$ (46,209,220)	\$ (5,724,449)	\$ (137,203,073)
8. Total Pension Liability – Beginning	1,600,196,105	424,034,380	786,677,460	99,601,281	2,910,509,226
9. Total Pension Liability – Ending	<b>\$ 1,508,443,898</b>	<b>\$ 430,517,183</b>	<b>\$ 740,468,240</b>	<b>\$ 93,876,832</b>	<b>\$ 2,773,306,153</b>
<b>B. Plan Fiduciary Net Position</b>					
1. Contributions – employer	\$ 22,764,999	\$ 110,001	\$ 42,900,000	\$ 2,500,000	\$ 68,275,000
2. Contributions – employee	-	-	-	-	-
3. Net investment income	89,268,993	16,636,424	43,168,097	6,349,679	155,423,193
4. Benefit payments, including refunds of employee contributions	(141,321,034)	(36,880,997)	(67,419,972)	(7,820,627)	(253,442,630)
5. Pension Plan Administrative Expense	(2,787,861)	(385,145)	-	(140,412)	(3,313,418)
6. Other	3,632,647	1,191,567	1,971,590	156,718	6,952,522
7. Net change in Plan Fiduciary Net Position	\$ (28,442,256)	\$ (19,328,150)	\$ 20,619,715	\$ 1,045,358	\$ (26,105,333)
8. Plan Fiduciary Net Position – Beginning	1,122,668,079	228,608,389	532,108,601	83,343,906	1,966,728,975
9. Plan Fiduciary Net Position – Ending	<b>\$ 1,094,225,823</b>	<b>\$ 209,280,239</b>	<b>\$ 552,728,316</b>	<b>\$ 84,389,264</b>	<b>\$ 1,940,623,642</b>
<b>C. Net Pension Liability</b>	<b>\$ 414,218,075</b>	<b>\$ 221,236,944</b>	<b>\$ 187,739,924</b>	<b>\$ 9,487,568</b>	<b>\$ 832,682,511</b>
<b>D. Plan Fiduciary Net Position as a percentage of the Total Pension Liability</b>	<b>72.54%</b>	<b>48.61%</b>	<b>74.65%</b>	<b>89.89%</b>	<b>69.98%</b>
<b>E. Covered-employee payroll</b>	<b>\$ 89,376,945</b>	<b>\$ 23,916,834</b>	<b>\$ 17,305,238</b>	<b>\$ 10,855,700</b>	<b>\$ 141,454,717</b>
<b>F. Net Pension Liability as a percentage of covered-employee payroll</b>	<b>463.45%</b>	<b>925.03%</b>	<b>1084.87%</b>	<b>87.40%</b>	<b>588.66%</b>

\*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,	2018	2017	2016	2015	2014
<b>Total Pension Liability</b>					
Service Cost	\$ -	\$ -	\$ -	\$ -	\$ 32,736,019
Interest on the Total Pension Liability	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	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	(239,301,938)	(242,938,006)	(242,470,451)	(253,217,949)	(253,683,194)
Refunds*	(14,140,692)	(24,311,533)	(49,811,728)	(44,321,041)	(144,050,613)
<b>Net Change in Total Pension Liability</b>	<b>(137,203,073)</b>	<b>(15,912,726)</b>	<b>(31,955,200)</b>	<b>(843,271,919)</b>	<b>(506,888,480)</b>
<b>Total Pension Liability - Beginning</b>	<b>2,910,509,226</b>	<b>2,926,421,952</b>	<b>2,958,377,152</b>	<b>3,801,649,071</b>	<b>4,308,537,551</b>
<b>Total Pension Liability - Ending (a)</b>	<b>\$ 2,773,306,153</b>	<b>\$ 2,910,509,226</b>	<b>\$ 2,926,421,952</b>	<b>\$ 2,958,377,152</b>	<b>\$ 3,801,649,071</b>
<b>Plan Fiduciary Net Position</b>					
Employer Contributions	\$ 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	155,423,193	206,896,567	(7,865,094)	93,054,978	289,789,607
Benefit Payments	(239,301,938)	(242,938,006)	(242,470,451)	(253,217,949)	(253,683,194)
Refunds*	(14,140,692)	(24,311,533)	(49,811,728)	(44,321,041)	(144,050,613)
Pension Plan Administrative Expense	(3,313,418)	(6,021,837)	(3,742,618)	(7,556,822)	(11,237,767)
Other	6,952,522	8,324,075	1,360,330	138,219,998	-
<b>Net Change in Plan Fiduciary Net Position</b>	<b>(26,105,333)</b>	<b>33,187,668</b>	<b>(197,736,904)</b>	<b>116,070,332</b>	<b>(83,814,075)</b>
<b>Plan Fiduciary Net Position - Beginning</b>	<b>1,966,728,975</b>	<b>1,933,541,307</b>	<b>2,131,278,211</b>	<b>2,015,207,879</b>	<b>2,099,021,954</b>
<b>Plan Fiduciary Net Position - Ending (b)</b>	<b>\$ 1,940,623,642</b>	<b>\$ 1,966,728,975</b>	<b>\$ 1,933,541,307</b>	<b>\$ 2,131,278,211</b>	<b>\$ 2,015,207,879</b>
<b>Net Pension Liability - Ending (a) - (b)</b>	<b>\$ 832,682,511</b>	<b>\$ 943,780,251</b>	<b>\$ 992,880,645</b>	<b>\$ 827,098,941</b>	<b>\$ 1,786,441,192</b>
<b>Plan Fiduciary Net Position as a Percentage</b>					
<b>of Total Pension Liability</b>	69.98 %	67.57 %	66.07 %	72.04 %	53.01 %
<b>Covered-Employee Payroll</b>	\$ 141,454,717	\$ 143,882,722	\$ 200,722,197	\$ 203,507,079	\$ 213,291,083
<b>Net Pension Liability as a Percentage</b>					
<b>of Covered-Employee Payroll</b>	588.66 %	655.94 %	494.65 %	406.42 %	837.56 %

Notes to Schedule:

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%

\* 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

<b>FY Ending June 30,</b>	<b>Actuarially Determined Contribution</b>	<b>Actual Contribution</b>	<b>Contribution Deficiency (Excess)</b>	<b>Covered Payroll*</b>	<b>Actual Contribution as a % of Covered Payroll</b>
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%

*\* 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.

**Contribution Source**  
(\$ millions)

Fiscal Year	For DWSD Liabilities		For Other Liabilities					Total
	DWSD	Transfers	UTGO	State	DIA	Other	Transfers from DWSD	
2019	45.4	(2.5)	-	-	0.4	22.5	2.5	68.3
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 was not made available to Gabriel, Roeder, Smith & Company for this report.



## SECTION D

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### 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, 2018. 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)	\$3,018,398,727	\$2,773,306,153	\$2,563,861,908
Net Position Restricted for Pensions	1,940,623,642	1,940,623,642	1,940,623,642
Net Pension Liability (NPL)	\$1,077,775,085	\$ 832,682,511	\$ 623,238,266

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	11,834
Inactive Plan Members Entitled to But Not Yet Receiving Benefits	3,355
Active Plan Members	<u>3,025</u>
Total Plan Members	18,214

Additional information regarding the plan population may be found in the June 30, 2017 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**

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**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.

## ***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.

## ***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**

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### **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, 2018. 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 2017	Future Life Expectancy (years)	
	Men	Women
45	38.51	41.86
50	33.56	36.81
55	28.80	31.91
60	24.26	27.17
65	19.97	22.60
70	15.99	18.30
75	12.37	14.34
80	9.19	10.84

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

<b>Retirement Ages</b>	<b>Percent of Eligible Active Members Retiring Within Next Year With Reduced Benefits</b>
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

<b>Benefit Service</b>	Exact Fractional service is used to determine the amount of benefit payable.
<b>Decrement Operation</b>	Disability and mortality decrements do not operate during the first 5 years of service. Disability and withdrawal also do not operate during retirement eligibility.
<b>Decrement Timing</b>	Decrement of all types are assumed to occur mid-year.
<b>Eligibility Testing</b>	Eligibility for benefits is determined based upon the age nearest birthday and rounded service on the date the decrement is assumed to occur.
<b>Forfeitures</b>	None.
<b>Incidence of Contributions</b>	Contributions are assumed to be received at the middle of the year.
<b>Marriage Assumption</b>	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.
<b>Normal Form of Benefit</b>	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.
<b>Service Credit Accruals</b>	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.
<b>Administrative Expenses</b>	3.00% of Component I payroll. 60% was allocated to Component II and 40% to Component I.
<b>Sick Leave</b>	Sick leave banks as of June 30, 2014 were included in the 2014 data file provided by the System.
<b>Member Contributions</b>	Member contributions to this Component II plan are assumed to have ceased with the bankruptcy.

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

## SECTION G

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### 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 3.62%; and the resulting Single Discount Rate is 7.38% as of June 30, 2018.

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, 2018, the employer contributions for the 10-year period ending June 30, 2023 were set by the 8<sup>th</sup> 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.

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, 2018, the benefit payments reflect the plan provisions in force as of June 30, 2018.

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

# Single Discount Rate Development

## Projection of Contributions

### End of Year

Fiscal Year Ending June 30,	Projected Contributions from Current Employees	Projected Service Cost	Administrative Expense Contributions	Projected UAL Contributions	Projected Total Contributions
2019	\$ -	\$ -	\$ 3,497,750	\$ 64,777,250	\$ 68,275,000
2020	-	-	3,205,198	44,969,802	48,175,000
2021	-	-	2,978,270	45,296,730	48,275,000
2022	-	-	2,797,667	45,477,333	48,275,000
2023	-	-	2,653,679	45,621,321	48,275,000
2024	-	-	2,523,794	91,995,705	94,519,499
2025	-	-	2,394,328	89,883,296	92,277,624
2026	-	-	2,271,046	87,770,886	90,041,932
2027	-	-	2,136,186	85,658,477	87,794,663
2028	-	-	2,002,200	83,546,068	85,548,268
2029	-	-	1,879,394	81,433,659	83,313,053
2030	-	-	1,763,090	79,321,250	81,084,340
2031	-	-	1,651,038	77,208,841	78,859,879
2032	-	-	1,543,409	75,096,432	76,639,841
2033	-	-	1,440,290	72,984,022	74,424,312
2034	-	-	1,343,298	70,871,613	72,214,911
2035	-	-	1,253,014	68,759,204	70,012,218
2036	-	-	1,168,223	66,646,795	67,815,018
2037	-	-	1,087,118	64,534,386	65,621,504
2038	-	-	1,010,496	62,421,977	63,432,473
2039	-	-	937,909	60,309,568	61,247,477
2040	-	-	869,402	58,197,158	59,066,560
2041	-	-	805,495	56,084,749	56,890,244
2042	-	-	743,787	53,972,340	54,716,127
2043	-	-	684,084	51,859,931	52,544,015
2044	-	-	626,154	49,747,522	50,373,676
2045	-	-	569,576	47,635,113	48,204,689
2046	-	-	513,384	45,522,703	46,036,087
2047	-	-	455,242	43,410,294	43,865,536
2048	-	-	397,915	41,297,885	41,695,800
2049	-	-	344,761	39,185,476	39,530,237
2050	-	-	295,407	37,073,067	37,368,474
2051	-	-	249,365	34,960,658	35,210,023
2052	-	-	207,080	32,848,249	33,055,329
2053	-	-	169,422	30,735,839	30,905,261
2054	-	-	136,713	-	136,713
2055	-	-	108,597	-	108,597
2056	-	-	84,758	-	84,758
2057	-	-	65,004	-	65,004
2058	-	-	49,105	-	49,105
2059	-	-	36,697	-	36,697
2060	-	-	27,029	-	27,029
2061	-	-	19,455	-	19,455
2062	-	-	13,770	-	13,770
2063	-	-	9,658	-	9,658
2064	-	-	6,740	-	6,740
2065	-	-	4,688	-	4,688
2066	-	-	3,265	-	3,265
2067	-	-	2,275	-	2,275
2068	-	-	1,576	-	1,576

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)
2019	\$ 1,940,623,642	\$ 68,275,000	\$ 247,425,761	\$ 13,852,954	\$ 3,497,750	\$ 133,929,907	\$ 1,878,052,085
2020	1,878,052,085	48,175,000	245,860,670	13,852,954	3,205,198	128,832,438	1,792,140,701
2021	1,792,140,701	48,275,000	244,044,462	13,852,954	2,978,270	122,760,852	1,702,300,867
2022	1,702,300,867	48,275,000	241,542,374	13,852,954	2,797,667	116,428,930	1,608,811,801
2023	1,608,811,801	48,275,000	238,780,884	13,852,954	2,653,679	109,846,322	1,511,645,607
2024	1,511,645,607	94,519,499	236,142,414	13,852,954	2,523,794	104,674,530	1,458,320,475
2025	1,458,320,475	92,277,624	233,407,554	13,852,954	2,394,328	100,996,076	1,401,939,338
2026	1,401,939,338	90,041,932	230,417,199	13,852,954	2,271,046	97,113,654	1,342,553,726
2027	1,342,553,726	87,794,663	226,854,858	13,852,954	2,136,186	93,043,183	1,280,547,575
2028	1,280,547,575	85,548,268	222,812,940	13,852,954	2,002,200	88,810,329	1,216,238,079
2029	1,216,238,079	83,313,053	218,178,383	-	1,879,394	84,802,302	1,164,295,657
2030	1,164,295,657	81,084,340	213,375,738	-	1,763,090	81,066,454	1,111,307,623
2031	1,111,307,623	78,859,879	208,226,668	-	1,651,038	77,265,995	1,057,555,791
2032	1,057,555,791	76,639,841	202,999,729	-	1,543,409	73,411,991	1,003,064,484
2033	1,003,064,484	74,424,312	197,403,519	-	1,440,290	69,516,796	948,161,784
2034	948,161,784	72,214,911	191,223,309	-	1,343,298	65,612,407	893,422,496
2035	893,422,496	70,012,218	184,602,908	-	1,253,014	61,736,032	839,314,824
2036	839,314,824	67,815,018	177,747,040	-	1,168,223	57,914,804	786,129,383
2037	786,129,383	65,621,504	170,623,684	-	1,087,118	54,171,331	734,211,416
2038	734,211,416	63,432,473	163,346,534	-	1,010,496	50,526,972	683,813,831
2039	683,813,831	61,247,477	155,788,229	-	937,909	47,005,007	635,340,176
2040	635,340,176	59,066,560	148,084,401	-	869,402	43,630,302	589,083,236
2041	589,083,236	56,890,244	140,301,782	-	805,495	40,422,047	545,288,249
2042	545,288,249	54,716,127	132,410,952	-	743,787	37,399,405	504,249,043
2043	504,249,043	52,544,015	124,566,334	-	684,084	34,578,466	466,121,106
2044	466,121,106	50,373,676	116,750,178	-	626,154	31,971,346	431,089,796
2045	431,089,796	48,204,689	108,973,919	-	569,576	29,591,311	399,342,301
2046	399,342,301	46,036,087	101,303,908	-	513,384	27,449,772	371,010,868
2047	371,010,868	43,865,536	93,824,075	-	455,242	25,553,445	346,150,532
2048	346,150,532	41,695,800	86,562,797	-	397,915	23,905,363	324,790,984
2049	324,790,984	39,530,237	79,564,674	-	344,761	22,506,103	306,917,889
2050	306,917,889	37,368,474	72,849,578	-	295,407	21,353,884	292,495,263
2051	292,495,263	35,210,023	66,442,742	-	249,365	20,445,138	281,458,317
2052	281,458,317	33,055,329	60,368,802	-	207,080	19,774,190	273,711,954
2053	273,711,954	30,905,261	54,643,947	-	169,422	19,333,436	269,137,283
2054	269,137,283	136,713	49,271,834	-	136,713	18,076,562	237,942,011
2055	237,942,011	108,597	44,257,873	-	108,597	15,956,073	209,640,211
2056	209,640,211	84,758	39,603,893	-	84,758	14,036,075	184,072,394
2057	184,072,394	65,004	35,306,401	-	65,004	12,304,925	161,070,918
2058	161,070,918	49,105	31,357,801	-	49,105	10,750,526	140,463,644
2059	140,463,644	36,697	27,747,269	-	36,697	9,360,567	122,076,942
2060	122,076,942	27,029	24,462,320	-	27,029	8,122,685	105,737,306
2061	105,737,306	19,455	21,487,718	-	19,455	7,024,629	91,274,218
2062	91,274,218	13,770	18,806,611	-	13,770	6,054,425	78,522,032
2063	78,522,032	9,658	16,401,060	-	9,658	5,200,499	67,321,471
2064	67,321,471	6,740	14,252,353	-	6,740	4,451,773	57,520,891
2065	57,520,891	4,688	12,341,383	-	4,688	3,797,750	48,977,258
2066	48,977,258	3,265	10,648,913	-	3,265	3,228,571	41,556,916
2067	41,556,916	2,275	9,155,961	-	2,275	2,735,059	35,136,013
2068	35,136,013	1,576	7,844,157	-	1,576	2,308,740	29,600,597

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

# Single Discount Rate Development

## Projection of Plan Fiduciary Net Position

### End of Year (Concluded)

Fiscal Year Ending June 30,	Projected Beginning Plan Net Position	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)
2069	\$ 29,600,597	\$ 1,082	\$ 6,696,008	\$ -	\$ 1,082	\$ 1,941,839	\$ 24,846,427
2070	24,846,427	734	5,695,073	-	734	1,627,259	20,778,613
2071	20,778,613	493	4,825,937	-	493	1,358,554	17,311,230
2072	17,311,230	329	4,074,194	-	329	1,129,907	14,366,942
2073	14,366,942	215	3,426,521	-	215	936,092	11,876,513
2074	11,876,513	137	2,870,705	-	137	772,443	9,778,251
2075	9,778,251	87	2,395,603	-	87	634,811	8,017,459
2076	8,017,459	53	1,991,095	-	53	519,525	6,545,889
2077	6,545,889	31	1,648,041	-	31	423,356	5,321,204
2078	5,321,204	16	1,358,237	-	16	343,478	4,306,446
2079	4,306,446	6	1,114,417	-	6	277,426	3,469,454
2080	3,469,454	2	910,175	-	2	223,058	2,782,337
2081	2,782,337	-	739,880	-	-	178,521	2,220,977
2082	2,220,977	-	598,600	-	-	142,213	1,764,591
2083	1,764,591	-	482,023	-	-	112,757	1,395,324
2084	1,395,324	-	386,351	-	-	88,972	1,097,945
2085	1,097,945	-	308,245	-	-	69,857	859,557
2086	859,557	-	244,798	-	-	54,563	669,322
2087	669,322	-	193,496	-	-	42,383	518,209
2088	518,209	-	152,199	-	-	32,728	398,738
2089	398,738	-	119,100	-	-	25,110	304,749
2090	304,749	-	92,688	-	-	19,131	231,191
2091	231,191	-	71,699	-	-	14,463	173,955
2092	173,955	-	55,090	-	-	10,841	129,707
2093	129,707	-	42,004	-	-	8,050	95,753
2094	95,753	-	31,747	-	-	5,916	69,922
2095	69,922	-	23,758	-	-	4,299	50,463
2096	50,463	-	17,588	-	-	3,087	35,962
2097	35,962	-	12,864	-	-	2,188	25,285
2098	25,285	-	9,286	-	-	1,529	17,529
2099	17,529	-	6,610	-	-	1,054	11,972
2100	11,972	-	4,637	-	-	715	8,051
2101	8,051	-	3,203	-	-	478	5,325
2102	5,325	-	2,177	-	-	314	3,462
2103	3,462	-	1,455	-	-	203	2,210
2104	2,210	-	955	-	-	128	1,384
2105	1,384	-	615	-	-	80	848
2106	848	-	389	-	-	48	508
2107	508	-	240	-	-	29	297
2108	297	-	144	-	-	17	169
2109	169	-	85	-	-	9	94
2110	94	-	48	-	-	5	51
2111	51	-	27	-	-	3	27
2112	27	-	15	-	-	1	14
2113	14	-	8	-	-	1	7
2114	7	-	4	-	-	0	3
2115	3	-	2	-	-	0	1
2116	1	-	1	-	-	0	0
2117	0	-	0	-	-	0	-
2118	-	-	-	-	-	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				Present Value of	Present Value of	Present Value of
Ending June 30,	Beginning Plan Net	Projected Benefit	Funded Portion of	Unfunded Portion	Funded Benefit	Unfunded Benefit	Benefit
	Position	Payments	Benefit Payments	of Benefit Payments	Payments using Expected Return Rate (v)	Payments using Municipal Bond Rate (vf)	Payments using Single Discount Rate (sdr)
(a)	(b)	(c)	(d)	(e)	(f)=(d)*v <sup>a</sup> ((a)-.5)	(g)=(e)*vf <sup>a</sup> ((a)-.5)	(h)=(c)/((1+sdr) <sup>a</sup> ((a)-.5)
2019	\$ 1,832,203,002	\$ 247,425,761	\$ 247,425,761	\$ -	\$ 238,771,899	\$ -	\$ 238,771,899
2020	1,778,151,304	245,860,670	245,860,670	-	220,955,065	-	220,955,065
2021	1,701,207,071	244,044,462	244,044,462	-	204,249,244	-	204,249,244
2022	1,620,805,163	241,542,374	241,542,374	-	188,261,464	-	188,261,464
2023	1,537,249,516	238,780,884	238,780,884	-	173,318,235	-	173,318,235
2024	1,450,538,243	236,142,414	236,142,414	-	159,622,938	-	159,622,938
2025	1,408,216,917	233,407,554	233,407,554	-	146,930,789	-	146,930,789
2026	1,363,417,286	230,417,199	230,417,199	-	135,079,485	-	135,079,485
2027	1,316,221,208	226,854,858	226,854,858	-	123,850,906	-	123,850,906
2028	1,267,044,542	222,812,940	222,812,940	-	113,283,879	-	113,283,879
2029	1,216,238,079	218,178,383	218,178,383	-	103,303,735	-	103,303,735
2030	1,164,295,657	213,375,738	213,375,738	-	94,086,203	-	94,086,203
2031	1,111,307,623	208,226,668	208,226,668	-	85,505,461	-	85,505,461
2032	1,057,555,791	202,999,729	202,999,729	-	77,629,996	-	77,629,996
2033	1,003,064,484	197,403,519	197,403,519	-	70,301,662	-	70,301,662
2034	948,161,784	191,223,309	191,223,309	-	63,420,277	-	63,420,277
2035	893,422,496	184,602,908	184,602,908	-	57,016,748	-	57,016,748
2036	839,314,824	177,747,040	177,747,040	-	51,126,126	-	51,126,126
2037	786,129,383	170,623,684	170,623,684	-	45,704,233	-	45,704,233
2038	734,211,416	163,346,534	163,346,534	-	40,747,750	-	40,747,750
2039	683,813,831	155,788,229	155,788,229	-	36,191,364	-	36,191,364
2040	635,340,176	148,084,401	148,084,401	-	32,037,323	-	32,037,323
2041	589,083,236	140,301,782	140,301,782	-	28,267,454	-	28,267,454
2042	545,288,249	132,410,952	132,410,952	-	24,844,143	-	24,844,143
2043	504,249,043	124,566,334	124,566,334	-	21,765,938	-	21,765,938
2044	466,121,106	116,750,178	116,750,178	-	18,998,130	-	18,998,130
2045	431,089,796	108,973,919	108,973,919	-	16,514,008	-	16,514,008
2046	399,342,301	101,303,908	101,303,908	-	14,296,598	-	14,296,598
2047	371,010,868	93,824,075	93,824,075	-	12,330,975	-	12,330,975
2048	346,150,532	86,562,797	86,562,797	-	10,594,757	-	10,594,757
2049	324,790,984	79,564,674	79,564,674	-	9,068,941	-	9,068,941
2050	306,917,889	72,849,578	72,849,578	-	7,732,856	-	7,732,856
2051	292,495,263	66,442,742	66,442,742	-	6,568,059	-	6,568,059
2052	281,458,317	60,368,802	60,368,802	-	5,557,490	-	5,557,490
2053	273,711,954	54,643,947	54,643,947	-	4,684,732	-	4,684,732
2054	269,137,283	49,271,834	49,271,834	-	3,933,852	-	3,933,852
2055	237,942,011	44,257,873	44,257,873	-	3,290,686	-	3,290,686
2056	209,640,211	39,603,893	39,603,893	-	2,742,271	-	2,742,271
2057	184,072,394	35,306,401	35,306,401	-	2,276,683	-	2,276,683
2058	161,070,918	31,357,801	31,357,801	-	1,883,091	-	1,883,091
2059	140,463,644	27,747,269	27,747,269	-	1,551,753	-	1,551,753
2060	122,076,942	24,462,320	24,462,320	-	1,274,021	-	1,274,021
2061	105,737,306	21,487,718	21,487,718	-	1,042,187	-	1,042,187
2062	91,274,218	18,806,611	18,806,611	-	849,459	-	849,459
2063	78,522,032	16,401,060	16,401,060	-	689,891	-	689,891
2064	67,321,471	14,252,353	14,252,353	-	558,305	-	558,305
2065	57,520,891	12,341,383	12,341,383	-	450,221	-	450,221
2066	48,977,258	10,648,913	10,648,913	-	361,779	-	361,779
2067	41,556,916	9,155,961	9,155,961	-	289,680	-	289,680
2068	35,136,013	7,844,157	7,844,157	-	231,120	-	231,120

# Single Discount Rate Development

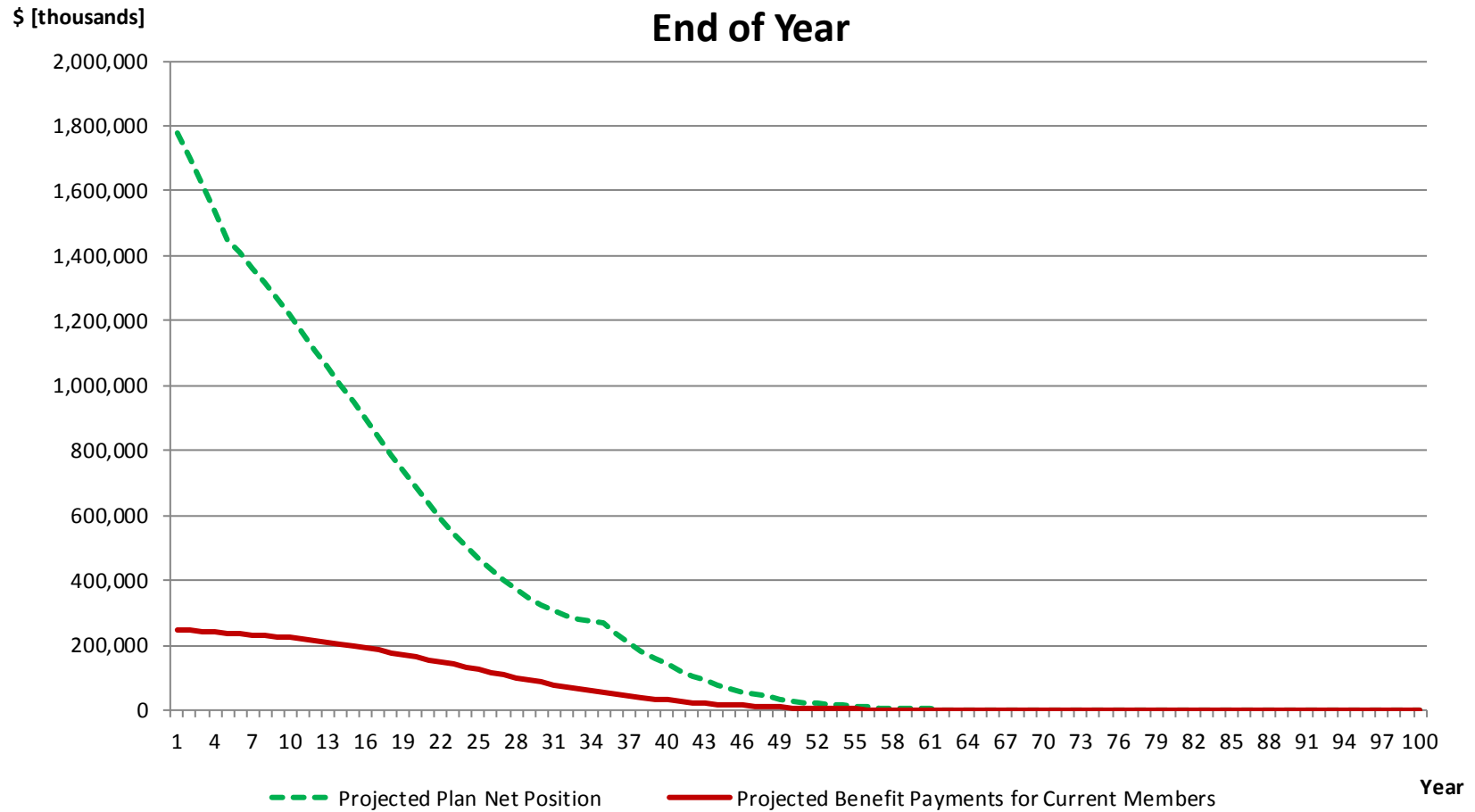
## Present Values of Projected Benefits

### End of Year

### (Excluding ASF) (Concluded)

Fiscal Year	Projected				Unfunded Portion	Present Value of	Present Value of	Present Value of
Ending	Beginning Plan Net	Projected Benefit	Funded Portion of	of Benefit	Expected Return	Funded Benefit	Unfunded Benefit	Benefit
June 30,	Position	Payments	Benefit Payments	Payments	Rate (v)	Payments using	Payments using	Payments using
						Municipal Bond	Single Discount	Rate (sdr)
(a)	(b)	(c)	(d)	(e)	(f)=(d)*v^((a)-.5)	(g)=(e)*vf ^((a)-.5)	'h)=((c)/(1+sdr)^(a-.5)	
2069	\$ 29,600,597	\$ 6,696,008	\$ 6,696,008	\$ -	\$ 183,732	\$ -	\$ 183,732	
2070	24,846,427	5,695,073	5,695,073	-	145,527	-	145,527	
2071	20,778,613	4,825,937	4,825,937	-	114,843	-	114,843	
2072	17,311,230	4,074,194	4,074,194	-	90,290	-	90,290	
2073	14,366,942	3,426,521	3,426,521	-	70,718	-	70,718	
2074	11,876,513	2,870,705	2,870,705	-	55,175	-	55,175	
2075	9,778,251	2,395,603	2,395,603	-	42,879	-	42,879	
2076	8,017,459	1,991,095	1,991,095	-	33,189	-	33,189	
2077	6,545,889	1,648,041	1,648,041	-	25,583	-	25,583	
2078	5,321,204	1,358,237	1,358,237	-	19,635	-	19,635	
2079	4,306,446	1,114,417	1,114,417	-	15,003	-	15,003	
2080	3,469,454	910,175	910,175	-	11,411	-	11,411	
2081	2,782,337	739,880	739,880	-	8,639	-	8,639	
2082	2,220,977	598,600	598,600	-	6,509	-	6,509	
2083	1,764,591	482,023	482,023	-	4,881	-	4,881	
2084	1,395,324	386,351	386,351	-	3,643	-	3,643	
2085	1,097,945	308,245	308,245	-	2,707	-	2,707	
2086	859,557	244,798	244,798	-	2,002	-	2,002	
2087	669,322	193,496	193,496	-	1,474	-	1,474	
2088	518,209	152,199	152,199	-	1,080	-	1,080	
2089	398,738	119,100	119,100	-	787	-	787	
2090	304,749	92,688	92,688	-	570	-	570	
2091	231,191	71,699	71,699	-	411	-	411	
2092	173,955	55,090	55,090	-	294	-	294	
2093	129,707	42,004	42,004	-	209	-	209	
2094	95,753	31,747	31,747	-	147	-	147	
2095	69,922	23,758	23,758	-	102	-	102	
2096	50,463	17,588	17,588	-	71	-	71	
2097	35,962	12,864	12,864	-	48	-	48	
2098	25,285	9,286	9,286	-	32	-	32	
2099	17,529	6,610	6,610	-	21	-	21	
2100	11,972	4,637	4,637	-	14	-	14	
2101	8,051	3,203	3,203	-	9	-	9	
2102	5,325	2,177	2,177	-	6	-	6	
2103	3,462	1,455	1,455	-	4	-	4	
2104	2,210	955	955	-	2	-	2	
2105	1,384	615	615	-	1	-	1	
2106	848	389	389	-	1	-	1	
2107	508	240	240	-	0	-	0	
2108	297	144	144	-	0	-	0	
2109	169	85	85	-	0	-	0	
2110	94	48	48	-	0	-	0	
2111	51	27	27	-	0	-	0	
2112	27	15	15	-	0	-	0	
2113	14	8	8	-	0	-	0	
2114	7	4	4	-	0	-	0	
2115	3	2	2	-	0	-	0	
2116	1	1	1	-	0	-	0	
2117	0	0	0	-	0	-	0	
2118	0	-	-	-	-	-	-	
<b>Totals</b>					\$ 2,664,885,513	\$ -	\$ 2,664,885,513	

## Projection of Plan Net Position and Benefit Payments End of Year



## SECTION H

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### GLOSSARY OF TERMS



## Glossary of Terms

<b><i>Actuarial Accrued Liability (AAL)</i></b>	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."
<b><i>Actuarial Assumptions</i></b>	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.
<b><i>Accrued Service</i></b>	Service credited under the system which was rendered before the date of the actuarial valuation.
<b><i>Actuarial Equivalent</i></b>	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.
<b><i>Actuarial Cost Method</i></b>	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.
<b><i>Actuarial Gain (Loss)</i></b>	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.
<b><i>Actuarial Present Value (APV)</i></b>	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.
<b><i>Actuarial Valuation</i></b>	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.
<b><i>Actuarial Valuation Date</i></b>	The date as of which an actuarial valuation is performed.
<b><i>Actuarially Determined Contribution (ADC) or Annual Required Contribution (ARC)</i></b>	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

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# Glossary of Terms

<b>AFC</b>	Average Final Compensation.
<b>Amortization Payment</b>	The amortization payment is the periodic payment required to pay off an interest-discounted amount with payments of interest and principal.
<b>Amortization Method</b>	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).
<b>APTE</b>	Association of Professional and Technical Employees.
<b>ASF</b>	Annuity Savings Fund.
<b>Cost-of-Living Adjustments</b>	Postemployment benefit changes intended to adjust benefit payments for the effects of inflation.
<b>Cost-Sharing Multiple-Employer Defined Benefit Pension Plan (cost-sharing pension plan)</b>	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.
<b>Covered-Employee Payroll</b>	The payroll of covered employees, which is typically only the pensionable pay and does not include pay above any pay cap.
<b>Deferred Inflows and Outflows</b>	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.
<b>DIA</b>	Detroit Institute of Art.
<b>Discount Rate</b>	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"><li>1. The benefit payments to be made while the pension plans’ fiduciary net position is projected to be greater than the benefit payments that are projected to be made in the period; and</li><li>2. The present value of the benefit payments not in (1) above, discounted using the municipal bond rate.</li></ol>

## Glossary of Terms

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

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

October 31, 2018

Mr. David Cetlinski, Executive Director  
The General Retirement System of the City of Detroit  
One Detroit Center  
500 Woodward Avenue, Suite 3000  
Detroit, Michigan 48226

Dear Mr. Cetlinski:

Please find enclosed 30 copies of the GASB Statement Nos. 67 and 68 report of the General Retirement System of the City of Detroit.

Sincerely,



Kenneth G. Alberts

KGA:ah  
Enclosures

cc: David T. Kausch, GRS  
Judith A. Kermans, GRS

