

The General Retirement System of the City of Detroit

GASB Statement No. 67 Plan Reporting and
Accounting Schedules of Component II
June 30, 2017





October 31, 2017

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." 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. 67. 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. 67 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.

The benefit provisions reflected in this valuation for the development of the end of year 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. 67 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 meets the Qualification Standards of the American Academy of Actuaries to render the actuarial opinions contained herein.

Respectfully submitted,



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Judith A. Kermans, EA, FCA, MAAA



Kenneth G. Alberts

DTK:dj

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SECTION A

EXECUTIVE SUMMARY

Executive Summary as of June 30, 2017

Actuarial Valuation Date	June 30, 2016
Pension Plan's Fiscal Year Ending Date (Measurement Date & Reporting Date)	June 30, 2017

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 as of June 30, 2017

Single Discount Rate	6.91%
Long-Term Expected Rate of 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

**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. 67 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. 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.

Beginning of Year TPL

In the June 30, 2016 GASB Statement No. 67 report (dated November 18, 2016) the TPL was determined to be \$2,925,203,804. Subsequent to the issuance of that report, we received revised assets for purposes of performing the June 30, 2016 GASB Statement No. 68 valuation. Since the revision related to the portion of the assets allocated to the Annuity Savings Fund (ASF), it changed the TPL reported in the June 30, 2016 GASB Statement No. 68 report to \$2,926,421,952 (an increase of \$1,218,148). The System's auditor requested that we show the TPL reported in the June 30, 2016 GASB Statement No. 68 report as the beginning of year TPL in this report.

Accounting Standard

For pension plans that are administered through trusts or equivalent arrangements, Governmental Accounting Standards Board (GASB) Statement No. 67, “Financial Reporting for Pension Plans,” replaces the requirements of GASB Statement No. 25, “Financial Reporting for Defined Benefit Pension Plans and Note Disclosures for Defined Contribution Plans,” and GASB Statement No. 50, “Pension Disclosures.” GASB Statement No. 67 establishes standards of financial reporting for separately issued financial reports and specifies the required approach for measuring the pension liability of employers and non-employer contributing entities for benefits provided through the pension plan.

The following discussion provides a summary of the information that is required to be disclosed under this new accounting standard. 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 your internal staff will be responsible for preparing that information to comply with this accounting standard.

Financial Statements

GASB Statement No. 67 requires defined benefit pension plans to present two financial statements – a statement of fiduciary net position and a statement of changes in fiduciary net position.

The *statement of fiduciary net position* presents the following items as of the end of the pension plan’s reporting period, such as:

- assets;
- deferred inflows and outflows of resources;
- liabilities; and
- fiduciary net position (assets, plus deferred outflows, minus liabilities, minus deferred inflows).

The *statement of changes in fiduciary net position* presents the following for the plan’s reporting period:

- additions, such as contributions and investment income;
- deductions, such as benefit payments and expenses; and
- net increase or decrease in the fiduciary net position (the difference between additions and deductions).

Notes to Financial Statements

GASB Statement No. 67 also requires the notes of the plan's financial statements to include additional disclosure information. This disclosure information should include:

- a description of the types of benefits provided by the plan, as well as automatic or ad hoc COLAs;
- the number and classes of employees covered by the benefit terms;
- the composition of the pension plan's Board and the authority under which benefit terms may be amended;
- a description of the plan's funding policy, which includes member and employer contribution requirements;
- the pension plan's investment policies;
- a description of how fair value is determined;
- concentrations of investments greater than or equal to 5%;
- annual money-weighted rate of return on pension plan investments;
- the portion of the present value of benefits to be provided through the pension plan to current active and inactive plan members;
- the pension plan's fiduciary net position;
- the net pension liability;
- the pension plan's fiduciary net position as a percentage of the total pension liability;
- significant assumptions and methods used to calculate the total pension liability;
- inputs to the discount rates;
- certain information about mortality assumptions and the dates of experience studies; 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 does not have a DROP program).

Required Supplementary Information

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

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

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

Measurement of the Net Pension Liability

The net pension liability is to be measured as the total pension liability, less the amount of the pension plan's fiduciary net position. In actuarial terms, this will be 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).

Timing of the Valuation

An actuarial valuation to determine the total pension liability is required to be performed at least every two years. If the actuarial valuation is not calculated as of the plan's fiscal year end, the total pension liability is required to be rolled-forward from the actuarial valuation date to the pension plan's fiscal year end.

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 (which is published by Fidelity) 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-Year Municipal GO AA Index" rate from Fidelity); and the resulting Single Discount Rate is 6.91%, as of June 30, 2017.

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 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 contribution.

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 did not make such an evaluation.

Benefits as of June 30, 2016:

As of the June 30, 2016 census date:

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

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

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>
Total Assets	<u>\$ 2,056,056,141</u>

Liabilities

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

Net Position Restricted for Pensions \$ 1,966,728,975

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

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

Additions

Contributions

Employer	\$ 91,238,402
Employee	-
Other	-
Total Contributions	\$ 91,238,402

Investment Income

Investment Income	\$ 207,227,085
Net Investment Income	\$ 207,227,085

Other Income (Including ASF Interest)^	\$ 8,324,075
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Total Additions	\$ 306,789,562
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Deductions

Benefit Payments, including Refunds of Employee Contributions	\$ 267,249,539
Pension Plan Administrative Expense	6,352,355
Other	-
Total Deductions	\$ 273,601,894

Net Increase in Net Position	\$ 33,187,668
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Net Position Restricted for Pensions

Beginning of Year	\$ 1,933,541,307
End of Year	\$ 1,966,728,975

[^] 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.

SECTION C

REQUIRED SUPPLEMENTARY INFORMATION

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

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
Total Pension Liability				
Service Cost	\$ -	\$ -	\$ -	\$ 32,736,019
Interest on the Total Pension Liability	201,919,236	213,957,125	263,007,329	242,611,073
Benefit Changes	-	-	(732,535,007)	(113,311,571)
Difference between Expected and Actual Experience	(27,508,380)	(44,173,106)	24,644,530	-
Assumption Changes	76,925,957	90,034,927	(101,559,893)	(271,190,194)
Benefit Payments	(242,938,006)	(242,470,454)	(253,217,950)	(253,683,194)
Refunds	(24,311,533)	(49,811,727)	(44,321,041)	(144,050,613)
Net Change in Total Pension Liability	(15,912,726)	(32,463,235)	(843,982,032)	(506,888,480)
Total Pension Liability - Beginning*	2,926,421,952	2,957,667,039	3,801,649,071	4,308,537,551
Total Pension Liability - Ending (a)	\$ 2,910,509,226	\$ 2,925,203,804	\$ 2,957,667,039	\$ 3,801,649,071
Plan Fiduciary Net Position				
Employer Contributions	\$ 91,238,402	\$ 104,792,657	\$ 189,282,094	\$ 25,126,131
Employee Contributions	-	-	609,073	10,241,761
Pension Plan Net Investment Income	207,227,085	(12,450,547)	93,054,981	289,789,607
Benefit Payments	(242,938,006)	(242,470,452)	(253,217,950)	(253,683,194)
Refunds	(24,311,533)	(49,811,727)	(44,321,041)	(144,050,613)
Pension Plan Administrative Expense	(6,352,355)	(3,742,618)	(4,617,194)	(11,237,767)
Other	8,324,075	5,945,783	135,280,369	-
Net Change in Plan Fiduciary Net Position	33,187,668	(197,736,904)	116,070,332	(83,814,075)
Plan Fiduciary Net Position - Beginning	1,933,541,307	2,131,278,211	2,015,207,879	2,099,021,954
Plan Fiduciary Net Position - Ending (b)	\$ 1,966,728,975	\$ 1,933,541,307	\$ 2,131,278,211	\$ 2,015,207,879
Net Pension Liability - Ending (a) - (b)	\$ 943,780,251	\$ 991,662,497	\$ 826,388,828	\$ 1,786,441,192
Plan Fiduciary Net Position as a Percentage of Total Pension Liability	67.57 %	66.10 %	72.06 %	53.01 %
Covered-Employee Payroll	\$ 143,882,722	\$ 185,147,364	\$ 188,210,536	\$ 238,669,871
Net Pension Liability as a Percentage of Covered-Employee Payroll	655.94 %	535.60 %	439.10 %	748.50 %
Notes to Schedule:				
N/A				

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.

* 2017 value includes a post-2016 GASB 67 valuation change in the reported ASF of \$1,218,148.

Schedules of Required Supplementary Information

Schedule of the Net Pension Liability Multiyear

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%	\$ 238,669,871	748.50%
2015	2,957,667,039	2,131,278,211	826,388,828	72.06%	188,210,536	439.10%
2016	2,925,203,804	1,933,541,307	991,662,497	66.10%	185,147,364	535.60%
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 from actuarial valuation date (census date). Actual covered payroll paid during the year was unavailable.

Schedule of Contributions Multiyear

Last 10 Fiscal Years

FY Ending June 30,	Actuarially Determined Contribution	Actual Contribution	Contribution Deficiency (Excess)	Covered Payroll*	Actual Contribution as a % of Covered Payroll
2014	\$72,643,307	\$ 25,126,131	\$47,517,176	\$238,669,871	10.53%
2015	N/A	189,282,094	N/A	188,210,536	100.57%
2016	N/A	104,792,657	N/A	185,147,364	56.60%
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					Total
	DWSD	Transfers	UTGO	State	DIA	Other	Transfers from DWSD	
2018	45.4	(2.5)	-	-	0.4	22.5	2.5	68.3
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 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.

SECTION D

NOTES TO 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.

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	Current Single Discount	1% Increase
	5.91%	Rate Assumption 6.91%	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

Expected Real Returns by Asset Class

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

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 E

SUMMARY OF BENEFITS

Summary of Benefit Provisions Evaluated

Component II Frozen Benefits

All Component II benefits are frozen as of June 30, 2014 based on service and average final compensation accrued as of that date and the provisions of the Detroit General Retirement System as it existed on June 30, 2014. Frozen benefits are further reduced by 4.5% and all future cost-of-living adjustments (“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 adjusting the assets for 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 July 1, 1980: Age 40 with 8 years of service. Hired on or after July 1, 1980: 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 F

ACTUARIAL COST METHOD AND ACTUARIAL ASSUMPTIONS

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

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

Economic Assumptions

The investment return rate used in making the valuation was 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 2.25% 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 20 and 21. 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 22. 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

Probabilities of Age/Service Retirement for Members Eligible to Retire

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

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

Probabilities of Early Retirement for Members Eligible for Early Retirement

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

Rationale for assumption is 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		Others	
		EMS	D.O.T.	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 2002 to 2007 Experience Study.

Miscellaneous and Technical Assumptions

Benefit Service	Exact Fractional service is used to determine the amount of benefit payable.
Decrement Operation	Disability and mortality decrements do not operate during the first 5 years of service. Disability and withdrawal also do not operate during retirement eligibility.
Decrement Timing	Decrements of all types are assumed to occur mid-year.
Eligibility Testing	Eligibility for benefits is determined based upon the age nearest birthday and rounded service on the date the decrement is assumed to occur.
Forfeitures	None.
Incidence of Contributions	Contributions are assumed to be received at the middle of the year.
Marriage Assumption	100% of males and 100% of females are assumed to be married for purposes of death-in-service benefits. Male spouses are assumed to be three years older than female spouses for active member valuation purposes.
Normal Form of Benefit	Straight life is the normal form of benefit. 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.
Service Credit Accruals	Service accruals stop as of June 30, 2014 for measurement of Component II liabilities. However, future service in Component I may be used to satisfy benefit eligibility requirement in Component II. Members who became duty disabled prior to June 30, 2014 are assumed to get projected service from date of disability to conversion date. Members who become disabled after June 30, 2014 are assumed to get their frozen accrued benefit as of June 30, 2014 at date of conversion.
Administrative Expenses	3.55% of Component I payroll. 71% was allocated to Component II and 29% to Component I.
Sick Leave	As of June 30, 2014, this information was included in the 2014 Average Final Compensation (AFC) amounts.
AFC Adjustment	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.
Member Contributions	Member contributions to this Component II plan are assumed to have ceased with the bankruptcy.

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

SECTION G

CALCULATION OF THE SINGLE DISCOUNT RATE

Calculation of the Single Discount Rate at End of Year

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

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

For the purpose of this valuation, the expected rate of return on pension plan investments is 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, 2017, the employer contributions for the 10-year period ending June 30, 2023 were set by the 8th Amended Plan of Adjustment (POA), as adjusted by subsequent agreements. Subsequent employer contributions were determined by a closed 30-year level principle amortization of any unfunded actuarial accrued liability using 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 administration 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 Single Discount Rate (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

Single Discount Rate Development

Projection of Plan Fiduciary Net Position at 6.91%

End of Year (Concluded)

Fiscal Year	Projected Beginning Plan Net Position	Projected Total Contributions	Projected Benefit Payments	Projected ASF Refund	Projected Administrative Expenses	Projected Investment Earnings at 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)
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

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

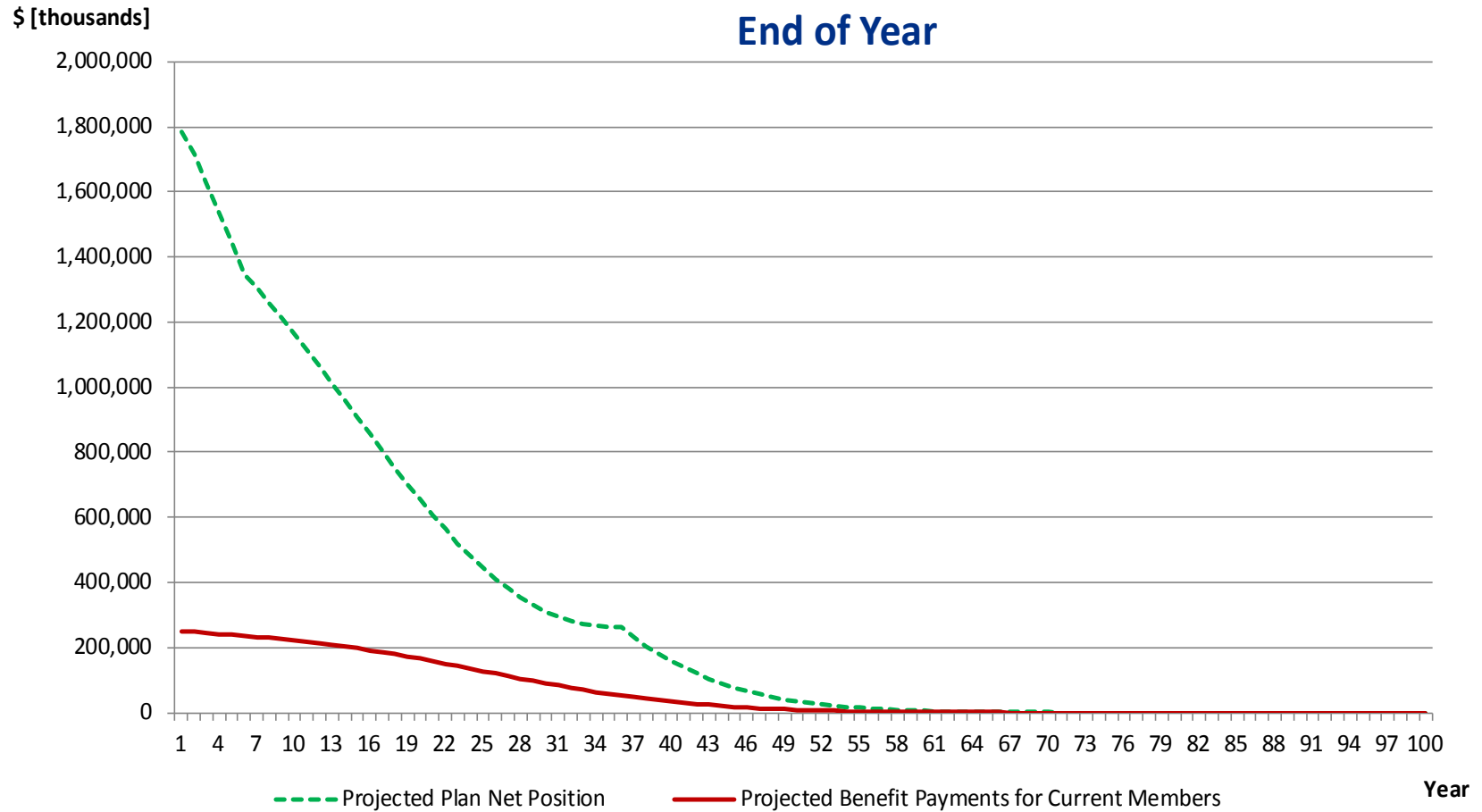
Present Values of Projected Benefits at 6.91%

End of Year

(Excluding ASF) (Concluded)

Fiscal Year	Projected 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)	
Ending June 30,	(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	-	-	-	-	-	-	
Totals	\$ 2,789,587,672	\$ 2,789,587,672	\$ 2,789,587,672	\$ -	\$ 2,789,587,672	\$ -	\$ 2,789,587,672	

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



SECTION H

GLOSSARY OF TERMS

Glossary of Terms

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

Glossary of Terms

<i>Amortization Payment</i>	The amortization payment is the periodic payment required to pay off an interest-discounted amount with payments of interest and principal.
<i>Amortization Method</i>	The method used to determine the periodic amortization payment may be a level dollar amount, or a level percent of pay amount. The period will typically be expressed in years, and the method will either be “open” (meaning, reset each year) or “closed” (the number of years remaining will decline each year).
<i>Annuity Savings Fund (ASF)</i>	Annuity Savings Fund of the Component II (Legacy) Plan.
<i>Cost-of-Living Adjustments</i>	Postemployment benefit changes intended to adjust benefit payments for the effects of inflation.
<i>Cost-Sharing Multiple-Employer Defined Benefit Pension Plan (cost-sharing pension plan)</i>	A multiple-employer defined benefit pension plan in which the pension obligations to the employees of more than one employer are pooled and pension plan assets can be used to pay the benefits of the employees of any employer that provides pensions through the pension plan.
<i>Covered-Employee Payroll</i>	The payroll of covered employees, which is typically only the pensionable pay and does not include pay above any pay cap.
<i>Deferred Inflows and Outflows</i>	The deferred inflows and outflows of pension resources are amounts used under GASB Statement No. 68 in developing the annual pension expense. Deferred inflows and outflows arise with differences between expected and actual experiences; changes of assumptions. The portion of these amounts not included in pension expense should be included in the deferred inflows or outflows of resources.
<i>DIA</i>	Detroit Institute of Art.
<i>Discount Rate</i>	For GASB purposes, the discount rate is the single rate of return that results in the present value of all projected benefit payments to be equal to the sum of the funded and unfunded projected benefit payments, specifically: <ol style="list-style-type: none">1. The benefit payments to be made while the pension plans’ fiduciary net position is projected to be greater than the benefit payments that are projected to be made in the period; and2. The present value of the benefit payments not in (1) above, discounted using the municipal bond rate.
<i>DWSD</i>	Detroit Water and Sewerage Department.

Glossary of Terms

Entry Age Actuarial Cost Method (EAN)

The EAN is a funding method for allocating the costs of the plan between the normal cost and the accrued liability. The actuarial present value of the projected benefits of each individual included in an actuarial valuation is allocated on a level basis (either level dollar or level percent of pay) over the earnings or service of the individual between entry age and assumed exit 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.

GASB

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

GLWA

Great Lakes Water Authority.

Fiduciary Net Position

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

Long-Term Expected Rate of Return

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

Money-Weighted Rate of Return

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

Multiple-Employer Defined Benefit Pension Plan

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

Municipal Bond Rate

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

Net Pension Liability (NPL)

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

Non-Employer Contribution Entities

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

Normal Cost

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

Glossary of Terms

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