

**THE GENERAL RETIREMENT SYSTEM OF THE  
CITY OF DETROIT**  
GASB STATEMENT NO. 67 PLAN REPORTING AND  
ACCOUNTING SCHEDULES OF COMPONENT II  
JUNE 30, 2016

November 18, 2016

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. 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, 2015. The total pension liability was rolled-forward from the valuation date to the plan year ending June 30, 2016 using generally accepted actuarial principles. The asset information as of June 30, 2016 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. 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 are not available. 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 7.23%, net of investment expenses, as of June 30, 2016, down from 7.61%, net of investment expenses, as of June 30, 2015. 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, 2016. We understand that Component I is a separate plan for GASB No. 67 purposes and will, therefore, be disclosed in a separate report.

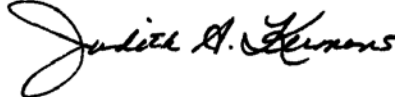
To the best of our knowledge, the information contained within this report is accurate and fairly represents the actuarial position of the System on the measurement date for purposes of GASB Statement No. 67 reporting. All calculations have been made in conformity with generally accepted actuarial principles and practices as well as with the Actuarial Standards of Practice issued by the Actuarial Standards Board.

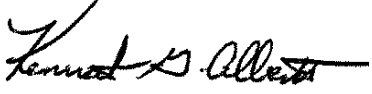
The signing individuals are independent of the plan sponsor.

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

Respectfully submitted,

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

By   
Judith A. Kermans, EA, FCA, MAAA

By   
Kenneth G. Alberts  
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DTK:dj

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**SECTION A**  
EXECUTIVE SUMMARY

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## EXECUTIVE SUMMARY AS OF JUNE 30, 2016

Actuarial Valuation Date	June 30, 2015
Pension Plan's Fiscal Year Ending Date (Measurement Date & Reporting Date)	June 30, 2016

### Membership

Number of	
- Retirees and Beneficiaries	11,884
- Inactive, Nonretired Members	2,732
- Active Members	4,688
- Total	19,304
Covered Payroll	\$ 200,722,197

### Net Pension Liability

Total Pension Liability	\$ 2,925,203,804
Plan Fiduciary Net Position	1,933,541,317
Net Pension Liability	\$ 991,662,487
Plan Fiduciary Net Position as a Percentage of Total Pension Liability	66.10%
Net Pension Liability as a Percentage of Covered Payroll	494.05%

### Development of the Single Discount Rate as of June 30, 2016

Single Discount Rate	7.23%
Long-Term Expected Rate of Return	7.23%
Long-Term Municipal Bond Rate *	2.85%
Last year ending June 30 in the 2017 to 2116 projection period for which projected benefit payments are fully funded	2116

*\*Source: "20-Bond GO Index" is the Bond Buyer Index, general obligation, 20 years to maturity, mixed quality. In describing this index, the Bond Buyer notes that the bonds' average credit quality is roughly equivalent to Moody's Investors Service's Aa2 rating and Standard & Poor's Corp.'s AA. The rate shown is as of June 30, 2016, the most recent date available on or before the measurement date.*

## DISCUSSION

### Changes to the Actuarial Assumptions

For purposes of determining the total pension liability as of June 30, 2016, the following actuarial assumptions were changed/modified from those used in the June 30, 2015 funding valuation:

- At the direction of the System and approval of the Systems' Auditor, the long-term expected return on assets was 7.23% net of investment expenses, as of June 30, 2016 (it was 6.75% net of investment and administrative expenses, in the June 30, 2015 funding valuation, as required by the Plan of Adjustment). The Single Discount Rate (SDR) changed to 7.23% from 7.61% when compared to the June 30, 2015 GASB 67 valuation.
- All other actuarial assumptions were the same as those used in the June 30, 2015 actuarial valuation (the funding valuation).

### Changes to the Benefit Provisions

There were no changes in benefit provisions during the year.

## 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, 2015, rolled to the plan year end of June 30, 2016.

## 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 Bond Buyer Index) 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 7.23%; the municipal bond rate is 2.85% (based on the weekly rate closest to but not later than the plan year end of the "state & local bonds" rate from Federal Reserve statistical release (H.15)); and the resulting Single Discount Rate is 7.23%, as of June 30, 2016.

## 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 (66.10% as of June 30, 2016). 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, 2015:**

As of the June 30, 2015 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, our liability calculation may differ.

The reported 6/30/2016 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, 2016 in accordance with GAAP accounting.

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## **SECTION B**

### **FINANCIAL STATEMENTS**

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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, 2016**

**Assets**

Cash and Deposits	N/A
Receivables	
Accounts Receivable - Sale of Investments	N/A
Accrued Interest and Other Dividends	N/A
Contributions	N/A
Accounts Receivable - Other	N/A
Total Receivables	N/A
Investments	
Fixed Income	N/A
Domestic Equities	N/A
International Equities	N/A
Real Estate	N/A
Other	N/A
Total Investments	N/A
<b>Total Assets</b>	N/A
 <b>Liabilities</b>	
Payables	
Accounts Payable - Purchase of Investments	N/A
Accrued Expenses	N/A
Accounts Payable - Other	N/A
<b>Total Liabilities</b>	N/A
<b>Net Position Restricted for Pensions</b>	\$ 1,933,541,317

Note: Asset detail of receivables, investments and payables was not provided.

**STATEMENT OF CHANGES IN FIDUCIARY NET POSITION  
FOR YEAR ENDED JUNE 30, 2016**

**Additions**

## Contributions

Employer	\$ 104,792,658
Employee	-
Other	-
<b>Total Contributions</b>	<b>\$ 104,792,658</b>

## Investment Income

Net Appreciation in Fair Value of Investments	\$ (31,098,116)
Interest and Dividends (including ASF interest)	32,462,306
Other Income	1,360,328
Less Investment Expense	(9,229,284)
<b>Net Investment Income</b>	<b>\$ (6,504,766)</b>
<b>Total Additions</b>	<b>\$ 98,287,892</b>

**Deductions**

Benefit Payments, including Refunds of Employee Contributions	\$ 292,282,181
Pension Plan Administrative Expense	3,742,601
Other	-
<b>Total Deductions</b>	<b>\$ 296,024,782</b>
<b>Net Increase in Net Position</b>	<b>\$ (197,736,890)</b>

**Net Position Restricted for Pensions**

Beginning of Year	\$ 2,131,278,207
End of Year	<b>\$ 1,933,541,317</b>

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## **SECTION C**

### **REQUIRED SUPPLEMENTARY INFORMATION**

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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,	2016	2015	2014
<b>Total Pension Liability</b>			
Service Cost	\$ -	\$ -	\$ 32,736,019
Interest on the Total Pension Liability	213,957,125	263,007,329	242,611,073
Benefit Changes	-	(732,535,007)	(113,311,571)
Difference between Expected and Actual Experience	(44,173,106)	24,644,530	-
Assumption Changes	90,034,927	(101,559,893)	(271,190,194)
Benefit Payments	(242,470,454)	(253,217,950)	(253,683,194)
Refunds	(49,811,727)	(44,321,041)	(144,050,613)
<b>Net Change in Total Pension Liability</b>	<b>(32,463,235)</b>	<b>(843,982,032)</b>	<b>(506,888,480)</b>
<b>Total Pension Liability - Beginning</b>	<b>2,957,667,039</b>	<b>3,801,649,071</b>	<b>4,308,537,551</b>
<b>Total Pension Liability - Ending (a)</b>	<b>\$ 2,925,203,804</b>	<b>\$ 2,957,667,039</b>	<b>\$ 3,801,649,071</b>
<b>Plan Fiduciary Net Position</b>			
Employer Contributions	\$ 104,792,658	\$ 189,282,094	\$ 25,126,131
Employee Contributions	-	609,073	10,241,761
Pension Plan Net Investment Income	(6,504,766)	92,178,117	299,534,236
Benefit Payments	(242,470,454)	(253,217,950)	(253,683,194)
Refunds	(49,811,727)	(44,321,041)	(144,050,613)
Pension Plan Administrative Expense	(3,742,601)	(4,617,194)	(20,982,396)
Other	-	135,280,369	-
<b>Net Change in Plan Fiduciary Net Position</b>	<b>(197,736,890)</b>	<b>115,193,468</b>	<b>(83,814,075)</b>
<b>Plan Fiduciary Net Position - Beginning</b>	<b>2,131,278,207 #</b>	<b>2,015,207,879</b>	<b>2,099,021,954</b>
<b>Plan Fiduciary Net Position - Ending (b)</b>	<b>\$ 1,933,541,317</b>	<b>\$ 2,130,401,347</b>	<b>\$ 2,015,207,879</b>
<b>Net Pension Liability - Ending (a) - (b)</b>	<b>\$ 991,662,487</b>	<b>\$ 827,265,692</b>	<b>\$ 1,786,441,192</b>
<b>Plan Fiduciary Net Position as a Percentage</b>			
<b>of Total Pension Liability</b>	66.10 %	72.03 %	53.01 %
<b>Covered-Employee Payroll</b>	\$ 200,722,197	\$ 203,507,079	\$ 213,291,083
<b>Net Pension Liability as a Percentage</b>			
<b>of Covered-Employee Payroll</b>	494.05 %	406.50 %	837.56 %

**Notes to Schedule:**

N/A

# Beginning of year value adjusted.

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 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%	\$ 213,291,083	837.56%
2015	2,957,667,039	2,130,401,347	827,265,692	72.03%	203,507,079	406.50%
2016	2,925,203,804	1,933,541,317	991,662,487	66.10%	200,722,197	494.05%

\* 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

<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	189,282,094	N/A	203,507,079	93.01%
2016	N/A	104,792,658	N/A	200,722,197	52.21%

\* 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. Furthermore, we understand that the City has modified all of its outstanding UTGO Stub Bonds. A revised contribution schedule (from Retirement System staff) showing actual fiscal year 2016 contributions as well as 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	
2016	\$ 45.4	\$ (2.5)	\$ 4.0	\$ -	\$ 32.9	\$ 22.5	\$ 2.5	\$ 104.8
2017	45.4	(2.5)	18.4	-	0.4	22.5	2.5	86.6
2018	45.4	(2.5)	4.5	-	0.4	22.5	2.5	72.7
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

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.

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## **SECTION D**

### **NOTES TO FINANCIAL STATEMENTS**

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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 7.23%, net of investment expenses, was used to measure the total pension liability as of June 30, 2016. This Single Discount Rate was based on the expected rate of return on pension plan investments of 7.23% 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 7.23%, 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

	Current Single Discount		
	1% Decrease 6.23%	Rate Assumption 7.23%	1% Increase 8.23%
Total Pension Liability (TPL)	\$3,190,768,870	\$2,925,203,804	\$2,699,374,959
Net Position Restricted for Pensions	1,933,541,317	1,933,541,317	1,933,541,317
Net Pension Liability (NPL)	\$1,257,227,553	\$ 991,662,487	\$ 765,833,642

### 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	11,884
Inactive Plan Members Entitled to But Not Yet Receiving Benefits	2,732
Active Plan Members	<u>4,688</u>
Total Plan Members	19,304

Additional information regarding the plan population may be found in the June 30, 2015 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.

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## **SECTION E**

### SUMMARY OF BENEFITS

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## 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 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).

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**SECTION F**

ACTUARIAL COST METHOD AND ACTUARIAL ASSUMPTIONS

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## 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 7.23% per year, compounded annually (net after investment expenses) as of June 30, 2016. 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 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 2015	Future Life Expectancy (years)	
	Males	Females
45	38.28	41.66
50	33.34	36.61
55	28.59	31.72
60	24.07	26.98
65	19.80	22.42
70	15.82	18.12
75	12.20	14.17
80	9.04	10.69

**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.

**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 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	143	584	188
		1068	212	212 x 0.95	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

<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>	Decrements 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 end 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 the benefit eligibility requirement in Component II.
<b>Administrative Expenses</b>	3.0% of Component I payroll. 50% was allocated to Component II and 50% to Component I based on actual administrative expenses.
<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.
<b>Member Contributions</b>	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.

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## **SECTION G**

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

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## 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 (which is published by the Bond Buyer Index) 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 7.23%; the municipal bond rate is 2.85%; and the resulting Single Discount Rate is 7.23% as of June 30, 2016.

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 7.23% 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 7.23% 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 7.23% 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, 2016, the benefit payments reflect the plan provisions in force as of June 30, 2016.

*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 7.23%  
END OF YEAR**

<b>Fiscal Year Ending June 30,</b>	<b>Projected Contributions from Current Employees</b>	<b>Projected Service Cost</b>	<b>Administrative Expense Contributions</b>	<b>Projected UAL Contributions</b>	<b>Projected Total Contributions</b>
2017	\$ -	\$ -	\$ 2,401,489	\$ 84,236,970	\$ 86,638,459
2018	-	-	2,207,115	70,528,605	72,735,720
2019	-	-	2,034,941	66,240,059	68,275,000
2020	-	-	1,877,133	46,297,867	48,175,000
2021	-	-	1,738,901	46,536,099	48,275,000
2022	-	-	1,612,762	46,662,238	48,275,000
2023	-	-	1,498,747	46,776,253	48,275,000
2024	-	-	1,394,322	109,651,291	111,045,613
2025	-	-	1,294,438	107,149,622	108,444,060
2026	-	-	1,204,637	104,647,953	105,852,590
2027	-	-	1,117,479	102,146,284	103,263,763
2028	-	-	1,033,404	99,644,616	100,678,020
2029	-	-	953,857	97,142,947	98,096,804
2030	-	-	876,732	94,641,278	95,518,010
2031	-	-	801,093	92,139,609	92,940,702
2032	-	-	727,439	89,637,941	90,365,380
2033	-	-	656,589	87,136,272	87,792,861
2034	-	-	591,347	84,634,603	85,225,950
2035	-	-	531,785	82,132,934	82,664,719
2036	-	-	476,642	79,631,265	80,107,907
2037	-	-	425,013	77,129,597	77,554,610
2038	-	-	377,208	74,627,928	75,005,136
2039	-	-	333,782	72,126,259	72,460,041
2040	-	-	294,617	69,624,590	69,919,207
2041	-	-	259,427	67,122,922	67,382,349
2042	-	-	227,645	64,621,253	64,848,898
2043	-	-	198,796	62,119,584	62,318,380
2044	-	-	172,055	59,617,915	59,789,970
2045	-	-	147,307	57,116,247	57,263,554
2046	-	-	125,325	54,614,578	54,739,903
2047	-	-	106,130	52,112,909	52,219,039
2048	-	-	89,282	49,611,240	49,700,522
2049	-	-	74,418	47,109,572	47,183,990
2050	-	-	61,207	44,607,903	44,669,110
2051	-	-	49,513	42,106,234	42,155,747
2052	-	-	39,341	39,604,565	39,643,906
2053	-	-	30,659	37,102,896	37,133,555
2054	-	-	23,383	-	23,383
2055	-	-	17,564	-	17,564
2056	-	-	13,018	-	13,018
2057	-	-	9,411	-	9,411
2058	-	-	6,642	-	6,642
2059	-	-	4,634	-	4,634
2060	-	-	3,209	-	3,209
2061	-	-	2,215	-	2,215
2062	-	-	1,525	-	1,525
2063	-	-	1,053	-	1,053
2064	-	-	729	-	729
2065	-	-	503	-	503
2066	-	-	344	-	344

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 7.23% 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 7.23% (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)
2017	\$ 1,933,541,317	\$ 86,638,459	\$ 247,919,452	\$ 18,545,080	\$ 2,401,489	\$ 130,624,351	\$ 1,881,938,105
2018	1,881,938,105	72,735,720	247,001,131	18,545,080	2,207,115	126,665,003	1,813,585,502
2019	1,813,585,502	68,275,000	246,415,038	18,545,080	2,034,941	121,829,314	1,736,694,757
2020	1,736,694,757	48,175,000	244,980,691	18,545,080	1,877,133	115,862,923	1,635,329,777
2021	1,635,329,777	48,275,000	242,984,723	18,545,080	1,738,901	108,876,920	1,529,212,994
2022	1,529,212,994	48,275,000	240,658,378	18,545,080	1,612,762	101,568,940	1,418,240,714
2023	1,418,240,714	48,275,000	237,877,342	18,545,080	1,498,747	93,940,178	1,302,534,723
2024	1,302,534,723	111,045,613	234,790,414	18,545,080	1,394,322	88,224,569	1,247,075,089
2025	1,247,075,089	108,444,060	231,640,195	18,545,080	1,294,438	84,561,010	1,188,600,446
2026	1,188,600,446	105,852,590	228,449,640	18,545,080	1,204,637	80,697,863	1,126,951,542
2027	1,126,951,542	103,263,763	224,729,409	-	1,117,479	77,124,543	1,081,492,960
2028	1,081,492,960	100,678,020	220,482,687	-	1,033,404	73,899,870	1,034,554,759
2029	1,034,554,759	98,096,804	215,774,148	-	953,857	70,584,624	986,508,182
2030	986,508,182	95,518,010	210,702,800	-	876,732	67,202,130	937,648,790
2031	937,648,790	92,940,702	205,236,464	-	801,093	63,774,898	888,326,834
2032	888,326,834	90,365,380	199,528,828	-	727,439	60,322,794	838,758,741
2033	838,758,741	87,792,861	193,492,899	-	656,589	56,864,555	789,266,669
2034	789,266,669	85,225,950	187,087,618	-	591,347	53,424,932	740,238,586
2035	740,238,586	82,664,719	180,305,064	-	531,785	50,032,255	692,098,711
2036	692,098,711	80,107,907	173,255,327	-	476,642	46,713,286	645,187,936
2037	645,187,936	77,554,610	166,056,602	-	425,013	43,488,472	599,749,403
2038	599,749,403	75,005,136	158,670,598	-	377,208	40,376,754	556,083,487
2039	556,083,487	72,460,041	151,040,576	-	333,782	37,401,863	514,571,033
2040	514,571,033	69,919,207	143,305,746	-	294,617	34,586,390	475,476,268
2041	475,476,268	67,382,349	135,544,799	-	259,427	31,946,644	439,001,035
2042	439,001,035	64,848,898	127,717,475	-	227,645	29,498,648	405,403,461
2043	405,403,461	62,318,380	119,949,675	-	198,796	27,256,592	374,829,962
2044	374,829,962	59,789,970	112,218,268	-	172,055	25,231,884	347,461,494
2045	347,461,494	57,263,554	104,565,918	-	147,307	23,436,092	323,447,914
2046	323,447,914	54,739,903	97,038,264	-	125,325	21,878,429	302,902,658
2047	302,902,658	52,219,039	89,711,385	-	106,130	20,564,395	285,868,577
2048	285,868,577	49,700,522	82,627,619	-	89,282	19,495,583	272,347,781
2049	272,347,781	47,183,990	75,818,114	-	74,418	18,671,040	262,310,279
2050	262,310,279	44,669,110	69,306,686	-	61,207	18,087,752	255,699,248
2051	255,699,248	42,155,747	63,108,430	-	49,513	17,741,075	252,438,126
2052	252,438,126	39,643,906	57,250,172	-	39,341	17,624,519	252,417,039
2053	252,417,039	37,133,555	51,745,710	-	30,659	17,729,651	255,503,876
2054	255,503,876	23,383	46,597,985	-	23,383	16,817,807	225,723,699
2055	225,723,699	17,564	41,806,811	-	17,564	14,834,879	198,751,767
2056	198,751,767	13,018	37,370,240	-	13,018	13,042,392	174,423,920
2057	174,423,920	9,411	33,283,478	-	9,411	11,428,647	152,569,089
2058	152,569,089	6,642	29,537,449	-	6,642	9,981,599	133,013,239
2059	133,013,239	4,634	26,120,086	-	4,634	8,689,093	115,582,247
2060	115,582,247	3,209	23,017,024	-	3,209	7,539,050	100,104,273
2061	100,104,273	2,215	20,212,002	-	2,215	6,519,625	86,411,897
2062	86,411,897	1,525	17,687,458	-	1,525	5,619,336	74,343,775
2063	74,343,775	1,053	15,425,050	-	1,053	4,827,170	63,745,894
2064	63,745,894	729	13,405,986	-	729	4,132,658	54,472,567
2065	54,472,567	503	11,611,335	-	503	3,525,941	46,387,174
2066	46,387,174	344	10,022,305	-	344	2,997,808	39,362,677

**SINGLE DISCOUNT RATE DEVELOPMENT  
PROJECTION OF PLAN FIDUCIARY NET POSITION AT 7.23%  
END OF YEAR (CONCLUDED)**

Fiscal Year	Projected Beginning Plan Net Position	Projected Total Contributions	Projected Benefit Payments	Projected ASF Refund	Projected Administrative Expenses	Projected Investment Earnings at 7.23% (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)
2066	\$ 46,387,174	\$ 344	\$ 10,022,305	\$ -	\$ 344	\$ 2,997,808	\$ 39,362,677
2067	39,362,677	235	8,620,592	-	235	2,539,725	33,281,810
2068	33,281,810	158	7,388,705	-	158	2,143,834	28,036,939
2069	28,036,939	105	6,310,118	-	105	1,802,940	23,529,761
2070	23,529,761	68	5,369,327	-	68	1,510,488	19,670,921
2071	19,670,921	43	4,551,820	-	43	1,260,531	16,379,632
2072	16,379,632	27	3,844,101	-	27	1,047,708	13,583,238
2073	13,583,238	16	3,233,752	-	16	867,208	11,216,694
2074	11,216,694	9	2,709,399	-	9	714,731	9,222,027
2075	9,222,027	4	2,260,665	-	4	586,456	7,547,818
2076	7,547,818	1	1,878,130	-	1	478,998	6,148,686
2077	6,148,686	-	1,553,306	-	-	389,378	4,984,758
2078	4,984,758	-	1,278,594	-	-	314,983	4,021,147
2079	4,021,147	-	1,047,260	-	-	253,531	3,227,418
2080	3,227,418	-	853,364	-	-	203,032	2,577,085
2081	2,577,085	-	691,683	-	-	161,755	2,047,158
2082	2,047,158	-	557,632	-	-	128,203	1,617,728
2083	1,617,728	-	447,171	-	-	101,079	1,271,635
2084	1,271,635	-	356,707	-	-	79,269	994,197
2085	994,197	-	283,068	-	-	61,826	772,956
2086	772,956	-	223,477	-	-	47,947	597,426
2087	597,426	-	175,513	-	-	36,960	458,873
2088	458,873	-	137,101	-	-	28,307	350,078
2089	350,078	-	106,492	-	-	21,528	265,114
2090	265,114	-	82,219	-	-	16,247	199,143
2091	199,143	-	63,055	-	-	12,158	148,246
2092	148,246	-	47,994	-	-	9,013	109,265
2093	109,265	-	36,217	-	-	6,613	79,661
2094	79,661	-	27,062	-	-	4,798	57,398
2095	57,398	-	20,001	-	-	3,439	40,836
2096	40,836	-	14,603	-	-	2,434	28,667
2097	28,667	-	10,520	-	-	1,699	19,846
2098	19,846	-	7,470	-	-	1,170	13,546
2099	13,546	-	5,225	-	-	794	9,114
2100	9,114	-	3,600	-	-	531	6,045
2101	6,045	-	2,443	-	-	350	3,953
2102	3,953	-	1,632	-	-	228	2,549
2103	2,549	-	1,075	-	-	146	1,619
2104	1,619	-	698	-	-	92	1,014
2105	1,014	-	447	-	-	57	624
2106	624	-	282	-	-	35	377
2107	377	-	175	-	-	21	223
2108	223	-	107	-	-	12	129
2109	129	-	63	-	-	7	72
2110	72	-	37	-	-	4	40
2111	40	-	21	-	-	2	21
2112	21	-	12	-	-	1	11
2113	11	-	6	-	-	1	5
2114	5	-	3	-	-	0	2
2115	2	-	2	-	-	0	0

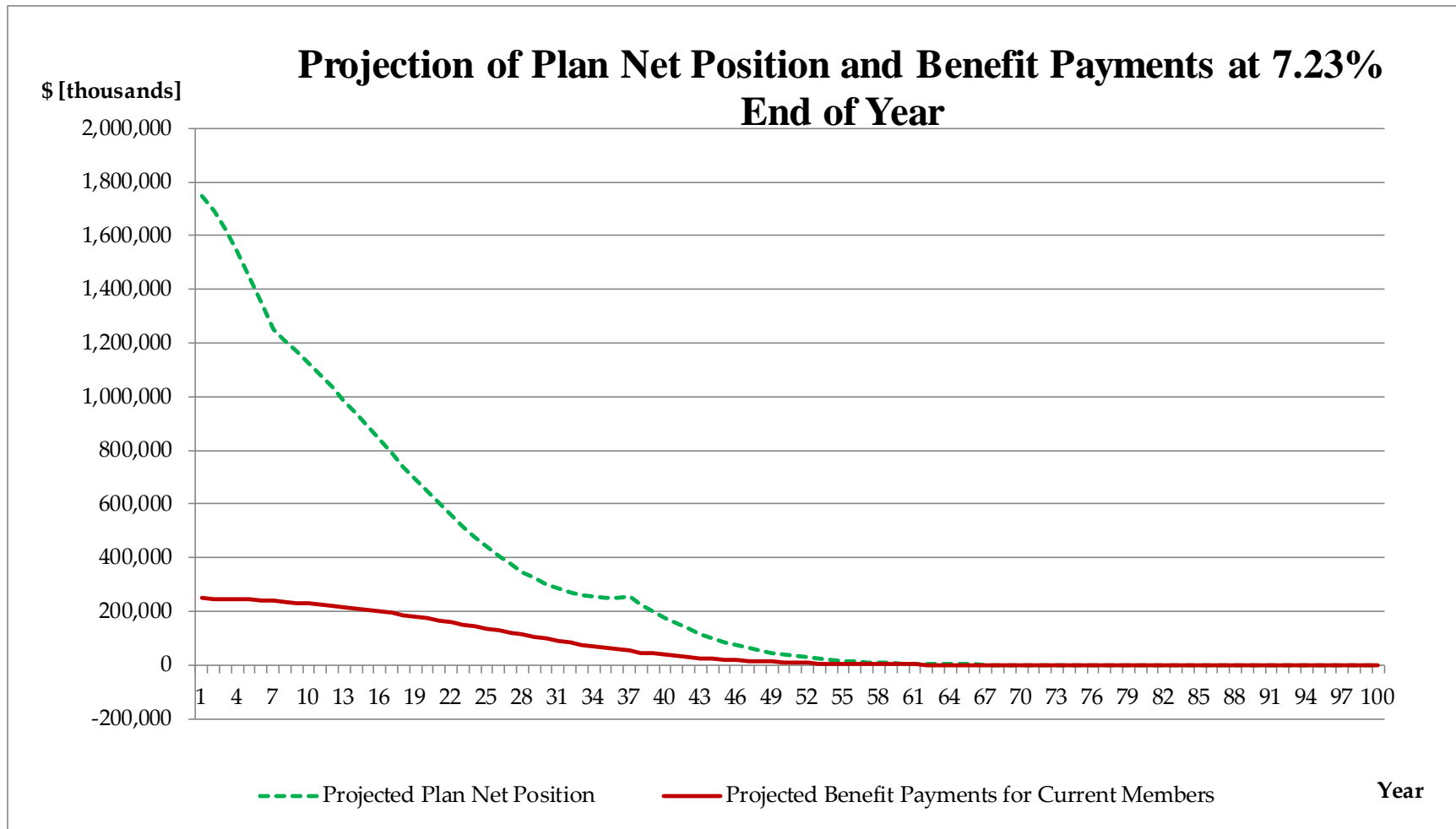
**SINGLE DISCOUNT RATE DEVELOPMENT  
PRESENT VALUES OF PROJECTED BENEFITS AT 7.23%  
END OF YEAR  
(EXCLUDING ASF)**

Fiscal Year	Projected	Funded Portion	Unfunded Portion	Present Value of	Present Value of	Present Value of	
Ending June 30,	Beginning Plan Net Position	Projected Benefit Payments	of Benefit Payments	of Benefit Payments	Funded Benefit Payments using Expected Return Rate (v)	Unfunded Benefit Payments using Municipal Bond Rate (vf)	Benefit Payments using Single Discount Rate (sdr)
(a)	(b)	(c)	(d)	(e)	(f)=(d)*v <sup>(a)-.5</sup>	(g)=(e)*vf <sup>(a)-.5</sup>	(h)=(c)/(1+sdr) <sup>(a)-.5</sup>
2017	\$ 1,788,381,749	\$ 247,919,452	\$ 247,919,452	\$ -	\$ 239,415,603	\$ -	\$ 239,415,603
2018	1,748,185,397	247,001,131	247,001,131	-	222,445,940	-	222,445,940
2019	1,691,838,513	246,415,038	246,415,038	-	206,955,248	-	206,955,248
2020	1,627,583,788	244,980,691	244,980,691	-	191,877,824	-	191,877,824
2021	1,539,518,219	242,984,723	242,984,723	-	177,482,523	-	177,482,523
2022	1,447,399,065	240,658,378	240,658,378	-	163,931,081	-	163,931,081
2023	1,351,159,291	237,877,342	237,877,342	-	151,111,351	-	151,111,351
2024	1,250,959,262	234,790,414	234,790,414	-	139,093,895	-	139,093,895
2025	1,211,819,653	231,640,195	231,640,195	-	127,975,054	-	127,975,054
2026	1,170,521,836	228,449,640	228,449,640	-	117,702,468	-	117,702,468
2027	1,126,951,542	224,729,409	224,729,409	-	107,978,850	-	107,978,850
2028	1,081,492,960	220,482,687	220,482,687	-	98,795,457	-	98,795,457
2029	1,034,554,759	215,774,148	215,774,148	-	90,166,578	-	90,166,578
2030	986,508,182	210,702,800	210,702,800	-	82,110,780	-	82,110,780
2031	937,648,790	205,236,464	205,236,464	-	74,587,850	-	74,587,850
2032	888,326,834	199,528,828	199,528,828	-	67,624,320	-	67,624,320
2033	838,758,741	193,492,899	193,492,899	-	61,156,973	-	61,156,973
2034	789,266,669	187,087,618	187,087,618	-	55,145,451	-	55,145,451
2035	740,238,586	180,305,064	180,305,064	-	49,562,849	-	49,562,849
2036	692,098,711	173,255,327	173,255,327	-	44,413,871	-	44,413,871
2037	645,187,936	166,056,602	166,056,602	-	39,698,297	-	39,698,297
2038	599,749,403	158,670,598	158,670,598	-	35,374,954	-	35,374,954
2039	556,083,487	151,040,576	151,040,576	-	31,403,406	-	31,403,406
2040	514,571,033	143,305,746	143,305,746	-	27,786,280	-	27,786,280
2041	475,476,268	135,544,799	135,544,799	-	24,509,438	-	24,509,438
2042	439,001,035	127,717,475	127,717,475	-	21,536,966	-	21,536,966
2043	405,403,461	119,949,675	119,949,675	-	18,863,269	-	18,863,269
2044	374,829,962	112,218,268	112,218,268	-	16,457,549	-	16,457,549
2045	347,461,494	104,565,918	104,565,918	-	14,301,297	-	14,301,297
2046	323,447,914	97,038,264	97,038,264	-	12,376,903	-	12,376,903
2047	302,902,658	89,711,385	89,711,385	-	10,670,880	-	10,670,880
2048	285,868,577	82,627,619	82,627,619	-	9,165,615	-	9,165,615
2049	272,347,781	75,818,114	75,818,114	-	7,843,195	-	7,843,195
2050	262,310,279	69,306,686	69,306,686	-	6,686,193	-	6,686,193
2051	255,699,248	63,108,430	63,108,430	-	5,677,731	-	5,677,731
2052	252,438,126	57,250,172	57,250,172	-	4,803,391	-	4,803,391
2053	252,417,039	51,745,710	51,745,710	-	4,048,827	-	4,048,827
2054	255,503,876	46,597,985	46,597,985	-	3,400,209	-	3,400,209
2055	225,723,699	41,806,811	41,806,811	-	2,844,915	-	2,844,915
2056	198,751,767	37,370,240	37,370,240	-	2,371,547	-	2,371,547
2057	174,423,920	33,283,478	33,283,478	-	1,969,783	-	1,969,783
2058	152,569,089	29,537,449	29,537,449	-	1,630,220	-	1,630,220
2059	133,013,239	26,120,086	26,120,086	-	1,344,410	-	1,344,410
2060	115,582,247	23,017,024	23,017,024	-	1,104,816	-	1,104,816
2061	100,104,273	20,212,002	20,212,002	-	904,761	-	904,761
2062	86,411,897	17,687,458	17,687,458	-	738,369	-	738,369
2063	74,343,775	15,425,050	15,425,050	-	600,507	-	600,507
2064	63,745,894	13,405,986	13,405,986	-	486,714	-	486,714
2065	54,472,567	11,611,335	11,611,335	-	393,135	-	393,135
2066	46,387,174	10,022,305	10,022,305	-	316,454	-	316,454



**SINGLE DISCOUNT RATE DEVELOPMENT  
PRESENT VALUES OF PROJECTED BENEFITS AT 7.23%  
END OF YEAR  
(EXCLUDING ASF) (CONCLUDED)**

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 <sup>(a)-.5</sup>	(g)=(e)*vf <sup>(a)-.5</sup>	(h)=(c)/(1+sdr) <sup>(a)-.5</sup>
2067	\$ 39,362,677	\$ 8,620,592	\$ 8,620,592	\$ -	\$ 253,842	\$ -	\$ 253,842
2068	33,281,810	7,388,705	7,388,705	-	202,898	-	202,898
2069	28,036,939	6,310,118	6,310,118	-	161,596	-	161,596
2070	23,529,761	5,369,327	5,369,327	-	128,232	-	128,232
2071	19,670,921	4,551,820	4,551,820	-	101,379	-	101,379
2072	16,379,632	3,844,101	3,844,101	-	79,844	-	79,844
2073	13,583,238	3,233,752	3,233,752	-	62,638	-	62,638
2074	11,216,694	2,709,399	2,709,399	-	48,942	-	48,942
2075	9,222,027	2,260,665	2,260,665	-	38,083	-	38,083
2076	7,547,818	1,878,130	1,878,130	-	29,506	-	29,506
2077	6,148,686	1,553,306	1,553,306	-	22,757	-	22,757
2078	4,984,758	1,278,594	1,278,594	-	17,469	-	17,469
2079	4,021,147	1,047,260	1,047,260	-	13,344	-	13,344
2080	3,227,418	853,364	853,364	-	10,140	-	10,140
2081	2,577,085	691,683	691,683	-	7,665	-	7,665
2082	2,047,158	557,632	557,632	-	5,763	-	5,763
2083	1,617,728	447,171	447,171	-	4,310	-	4,310
2084	1,271,635	356,707	356,707	-	3,206	-	3,206
2085	994,197	283,068	283,068	-	2,373	-	2,373
2086	772,956	223,477	223,477	-	1,747	-	1,747
2087	597,425	175,513	175,513	-	1,279	-	1,279
2088	458,873	137,101	137,101	-	932	-	932
2089	350,078	106,492	106,492	-	675	-	675
2090	265,114	82,219	82,219	-	486	-	486
2091	199,143	63,055	63,055	-	348	-	348
2092	148,246	47,994	47,994	-	247	-	247
2093	109,265	36,217	36,217	-	174	-	174
2094	79,661	27,062	27,062	-	121	-	121
2095	57,398	20,001	20,001	-	83	-	83
2096	40,836	14,603	14,603	-	57	-	57
2097	28,667	10,520	10,520	-	38	-	38
2098	19,846	7,470	7,470	-	25	-	25
2099	13,546	5,225	5,225	-	16	-	16
2100	9,114	3,600	3,600	-	11	-	11
2101	6,045	2,443	2,443	-	7	-	7
2102	3,953	1,632	1,632	-	4	-	4
2103	2,549	1,075	1,075	-	3	-	3
2104	1,619	698	698	-	2	-	2
2105	1,014	447	447	-	1	-	1
2106	624	282	282	-	1	-	1
2107	377	175	175	-	0	-	0
2108	223	107	107	-	0	-	0
2109	129	63	63	-	0	-	0
2110	72	37	37	-	0	-	0
2111	40	21	21	-	0	-	0
2112	21	12	12	-	0	-	0
2113	11	6	6	-	0	-	0
2114	5	3	3	-	0	-	0
2115	2	2	2	-	0	-	0
2116	-	-	-	-	-	-	-
<b>Totals</b>					<b>\$ 2,780,044,236</b>	<b>\$ -</b>	<b>\$ 2,780,044,236</b>



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**SECTION H**  
GLOSSARY OF TERMS

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## 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>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>Annuity Savings Fund (ASF)</i></b>	Annuity Savings Fund of the Component II (Legacy) Plan.
<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>	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>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.

## GLOSSARY OF TERMS

<b><i>Other Postemployment Benefits (OPEB)</i></b>	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.
<b><i>Plan of Adjustment (POA)</i></b>	The 8 <sup>th</sup> Amended Plan for the Adjustment of the Debt of the City of Detroit.
<b><i>Real Rate of Return</i></b>	The real rate of return is the rate of return on an investment after adjustment to eliminate inflation.
<b><i>Service Cost</i></b>	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.
<b><i>Total Pension Expense</i></b>	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"> <li>1. Service Cost</li> <li>2. Interest on the Total Pension Liability</li> <li>3. Current-Period Benefit Changes</li> <li>4. Employee Contributions (made negative for addition here)</li> <li>5. Projected Earnings on Plan Investments (made negative for addition here)</li> <li>6. Pension Plan Administrative Expense</li> <li>7. Other Changes in Plan Fiduciary Net Position</li> <li>8. Recognition of Outflow (Inflow) of Resources due to Liabilities</li> <li>9. Recognition of Outflow (Inflow) of Resources due to Assets</li> </ol>
<b><i>Total Pension Liability (TPL)</i></b>	The TPL is the portion of the actuarial present value of projected benefit payments that is attributed to past periods of member service.
<b><i>Unfunded Actuarial Accrued Liability (UAAL)</i></b>	The UAAL is the difference between actuarial accrued liability and valuation assets.
<b><i>Valuation Assets</i></b>	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.