Conduent Wealth Consulting
Conduent Human Resource Consulting

Retirement Plan for CTA Employees

Actuarial Valuation Report as of January 1, 2017, including supplementary disclosure information for GASB Statement No. 67

September 2017

September 2017

Board of Trustees and Executive Director
Retirement Plan for CTA Employees
10 S. LaSalle, Suite 1100
Chicago, IL 60602

Ladies and Gentlemen:

This report represents the results of the annual valuation of the assets and liabilities of The Retirement Plan for Chicago Transit Authority Employees (“the Plan”) as of January 1, 2017, prepared in accordance with 40 ILCS 5/22-101(e). In addition it includes disclosure information as of December 31, 2016, as required under GASB Statement No. 67. The actuarial valuation of the Plan is performed annually and Conduent HR Consulting, LLC (“Conduent””) was retained to perform the valuation as of January 1, 2017. This valuation has been conducted in accordance with all applicable Actuarial Standards of Practice (ASOPs) issued by the Actuarial Standards Board (ASB).

The actuarial valuation is based on unaudited financial and member data provided by the staff of the plan and summarized in this report. The benefits considered are those delineated in the plan and is governed by legislation contained in the Illinois Compiled statutes, particularly Chapter 40, as amended and restated effective December 31, 2012. The actuary did not verify the data submitted, but did perform tests for consistency and reasonableness.

Public Act 95-708, effective January 18, 2008, requires that the Plan’s pension and retiree health care programs be separated into two distinct trusts by July 1, 2009 (40 ILCS 5/22-101B(a)). This January 1, 2017 valuation report for the Plan does not reflect the liabilities and assets that were spun off into the healthcare trust.

Contribution rates were determined in accordance with 40 ILCS 5/22-101(e) using the projected unit credit cost method and provide for a funded ratio of at least 60 percent no later than ten years after the valuation year through fiscal year end 2039. Contribution rates reflect the issuance of bond or notes by the Authority, as defined in 70 ILCS 3605/12c. Authority contribution rates are adjusted by a debt service credit, for debt service paid in the prior year, of up to six percent of compensation per year from 2009 to 2040, as defined in 40 ILCS 5/22-101(e)(2).

Results of this valuation deviated from what was expected based on the January 1, 2016 actuarial valuation for a number of reasons including market returns of 6.8% compared to 8.25% assumed and payroll and salaried increases that were less than expected. Overall these events caused the funded ratio to not meet the standards set forth in ILCS 5/22-101(e) and therefore there is a need to increase authority and employee contribution rates to comply with 40 ILCS 5/22-101(e) as follows:

Annual Contributions to the Plan (Percentage of Compensation)		
Fiscal Year	Authority	Employees
2018 to 2040	18.019%	12.010%

Based on these rates, the sum of current assets, net bond proceeds, future contributions and investment earnings, less benefit payments and expenses, the Plan is projected to be at least equal to 60 percent of actuarial liabilities by 2027 and through fiscal year end 2040, if these contributions, expressed as a percentage of compensation, are made to the Plan and the Plan experiences no net actuarial losses in the future.

40 ILCS 5/22-101(e)(4) provides for a minimum contribution, determined either by the Board of Trustees or the Auditor General, to bring the funded ratio of the Plan "up to" or "no less than" 90% by December 31, 2059. Thus, the attached schedules contain such projected funded ratios.

While not required by 40 ILCS 5/22-101(e)(3), Conduent has recommended that the Board of Trustees consider, as appropriate, moving towards contributing an amount equal to the Actuarial Math Contribution.

- Fund 100% of the entry age normal cost method
- Use an actuarial value of assets to help mitigate contribution volatility
- Pay off the unfunded liability over 20 years using layered amortization

This methodology suggests a contribution of approximately 34.89% (total contribution).

The results documented in this report are estimated based on data that may be imperfect and on assumptions about future events. Assumptions may have been made about participant data or other factors. Reasonable efforts were made in this valuation to ensure that items that were significant in the context of the actuarial liabilities or costs are treated appropriately, and not excluded or included inappropriately. We believe that the use of approximation in our calculations, if any, has not resulted in a significant difference relative to the results we would have obtained using more detailed calculations.

A range of results, different from those presented in this report could be considered reasonable. The numbers are not rounded, but this is for convenience only and should not imply precision, which is not inherent in actuarial calculations.

This valuation was based on the actuarial assumptions and methods as approved by the Board of Trustees. Please see Section 6.2 and 6.3 of this report for a description of the assumptions and methods used. Actuarial Standards of Practice now require that the likelihood and extent of future mortality improvements be considered for valuations performed on or after June 30, 2011. Traditionally for the CTA Retirement Plan, experience studies are performed once in every five year period. Our initial conclusion is that the mortality tables currently in use and adopted by the Board provides for some future mortality improvements. The most recent study of the plan's experience, used in developing the current actuarial assumptions, was based on a period from January 1, 2008 through December 31, 2012 and first used with the January 1, 2014 actuarial valuation; the next review will cover the period from January 1, 2013 through December 31, 2017. The interest rate of 8.25% has been approved by the Board of Trustees. It is based upon a review of the existing portfolio structure, a review of recent experience, and future long-term expectations of rates of return. We believe that the economic and demographic assumptions adopted in accordance with the recent experience study and a review of recent experience are reasonable and appropriate for the purposes of this valuation.

All assumptions and methods used for this valuation are unchanged from the prior valuation except as follows:

- The Asset method was changed from the Market Value of Assets to a 5 year smoothed Actuarial Value of Assets

The assumptions and methods used to determine the Actuarial Math Contribution of the Plan as outlined in this report and all supporting schedules meet the parameters and requirements for disclosure of Governmental Accounting Standards Board (GASB) Statement No. 67, Financial Reporting for Defined Benefit Pension Plans and Note Disclosures for Defined Contribution Plans. Based on member data and asset information provided by the CTA Retirement Plan staff, we have prepared the Schedule of Funding Progress and Schedule of Employer Contributions that are included in the Financial Section of the Comprehensive Annual Financial Report. Because of the risk of misinterpretation of actuarial results, you should ask us to review any statement you wish to make on the results contained in this report. Conduent will accept no liability for any such statement made without our prior review.

Future actuarial measurements may differ significantly from the current measurement presented in this report due to such factors as: plan experience different from that anticipated by the economic and demographic assumptions; increases or decreases expected as part of the natural operation of the methodology used for these measurements; and changes in plan provisions or applicable law. Due to the limited scope of this report, an analysis of the potential range of such future measurements has not been performed.

Please note that GASB Statement No. 25 (Financial Reporting for Defined Benefit Pension Plans) is applicable for fiscal years ending prior to 2014 and has been replaced by GASB Statement No. 67 (Financial Reporting for Pension Plans) for fiscal years ending 2014 and later. Similarly, GASB Statement No. 27 (Accounting for Pensions by State and Local Governmental Employers) is applicable for fiscal years ending prior to 2015 and has been replaced by GASB Statement No. 68 (Accounting and Financial Reporting for Pensions) for fiscal years ending 2015 and later. We have prepared the required accounting information for Governmental Accounting Standards Board (GASB) Statement No. 67 for the fiscal year ending December 31, 2016 based on valuation dates of December 31, 2015 and December 31, 2016.

Board of Trustees and Executive Director
Retirement Plan for CTA Employees

All of the historical valuation results presented in this report represent results taken from prior actuarial reports and some years may reflect the funding methods and techniques used by the prior actuary. Our report/certification does not apply to those results other than to represent that our report has presented accurate information developed by prior actuaries.

Qualified actuaries completed the valuation in accordance with accepted actuarial procedures as prescribed by the Actuarial Standards Board. The qualified actuaries are members of the American Academy of Actuaries and are experienced in performing actuarial valuations of public employee retirement systems. To the best of our knowledge, this report is complete and accurate and has been prepared in accordance with generally accepted actuarial principles and practice. The undersigned with actuarial designations is qualified to render the opinions contained in this report and is available to respond to any questions you may have.

In my opinion the calculations also comply with Illinois law and where applicable, federal laws such as the Internal Revenue Code, and the Statements of the Governmental Accounting Standards Board. We certify that the information presented herein is accurate and fairly portrays the actuarial position of the Plan as of January 1, 2017.

Respectfully submitted,

Conduent HR Consulting, LLC

Aaron Shapiro

Aaron Shapiro, FSA, MAAA, EA
Principal and Consulting Actuary

Contents

Executive Summary

Overview

The Retirement Plan for CTA Employees provides pension and ancillary benefit payments to the retired, disabled and terminated employees of the Chicago Transit Authority. A Board of Trustees comprised of appointed representatives is responsible for administering the Plan and making investment decisions. This report presents the results of the actuarial valuation of the Plan benefits as of the valuation date of January 1, 2017.

Purpose of This Report

An actuarial valuation is performed on the retirement plan annually as of the beginning of the fiscal year. The main purposes of the actuarial valuation detailed in this report are:

1. To certify the statutory contribution requirements for plan year 2017, as required under 40 ILCS 5/22-101(e)(3);

2. To disclose the funding assets, liability measures and funded ratio as of the valuation date;

3. To disclose the accounting measures for the Plan required by GASB No. 67 as of the end of the last fiscal year;

4. To compare actual and expected experience under the Plan during the last fiscal year;

5. And to report trends in contributions, assets, liabilities, and funded status over the last several years.

Because of the risk of misinterpretation of actuarial results, you should ask us to review any statement you wish to make on the results contained in this report. Conduent will accept no liability for any such statement made without our prior review. This actuarial valuation provides a "snapshot" of the funded position of the Plan based on the Plan provisions, membership, assets, and actuarial assumptions as of the valuation date. Actuarial projections are also performed to provide a long-term view of the expected future funding status and contribution patterns.

Membership

Actives: As of January 1, 2017, there were 8,129 members in active service covered under the provisions of the Plan. The significant age, service, salary and accumulated contribution information for these members is summarized below, along with comparative figures from the last actuarial valuation one year earlier.

	January 1, 2017	January 1, 2016
Number of active employees [1]	8,129	8,204
Average age	48.6	48.4
Average years of service	13.6	13.7
Total annual valuation salary [2]	575,443,885	573,548,196
Average annual salary [2]	71,564	70,331
Total accumulated contributions	449,593,044	417,390,393
Average accumulated contributions	55,913	51,182

1 Active statistics include all participants who are actively employed which includes 16 participants who are on leave and 88 participants who have opted out of participating in the Plan and are only entitled to a return of their contributions.

2 The salary information for the 88 participants who have opted out of participating in the Plan is not included.

The number of active members decreased by 0.9% from the previous valuation date. The average age of the active members increased by 0.2 years, and the average service decreased by 0.1 years. The total annual valuation salary increased by 0.3%. The average salary increased by 1.75% from the previous valuation.

Distributions of active members by age and service are given in Section 5.2.

Inactives: In addition to the active members, there were 105 inactive vested members who did not elect to receive their accumulated contributions when they left covered employment. The significant age and annual benefit information for these inactive members is summarized below with comparative figures from the last actuarial valuation one year earlier.

	January 1, 2017	January 1, 2016
Number of inactive members	105	98
Average age	56.8	56.7
Average annual benefit payments	$26,861	$26,737

The number of inactive vested members increased by 7.1% from the previous valuation. The average age of the inactive vested members increased by 0.1 years. The Average Monthly Pension Benefit for these members increased by 0.5% from the previous valuation.

Distributions of inactive members by age and pension benefit are given in Section 5.4.

Retirees and Beneficiaries: In addition to the active and inactive members, there were 8,065 retired members, 1,178 members with disability allowances and 907 beneficiaries who are receiving monthly benefit payments on the valuation date. The significant age and annual benefit information for these members are summarized below with comparative figures from the last actuarial valuation performed one year earlier.

	January 1, 2017	January 1, 2016
Number of members receiving payments		
➢ Retirees	8,065	7,991
➢ Disability Allowances	1,178	1,159
➢ Beneficiaries	907	878
➢ Total	10,150	10,028
Average age	70.3	70.0
Annual benefit amounts		
➢ Retirees	231,877,188	224,664,030
➢ Disability Allowances	19,539,261	18,714,100
➢ Beneficiaries	10,627,755	9,871,344
➢ Total	262,044,204	253,249,474
Average annual benefit payments	25,817	25,254

The number of retired members and beneficiaries increased by 1.2% from the previous valuation date. The average age of these members increased by 0.3 years. The total annual benefit payments for these members increased by 3.5% from the previous valuation date.

Distributions of retired members by age and benefit amounts are given in Section 5.3.

In our opinion, the membership data collected and prepared for use in this actuarial valuation meets the data quality standards required under Actuarial Standards of Practice No. 23.

Plan Assets

The Plan's assets are held in trust and invested for the exclusive benefit of plan members. The trust is funded by member and employer contributions, and pays benefits directly to eligible members in accordance with plan provisions. The assets are audited annually and are reported at fair value. On a fair value basis, the Plan has Net Assets Available for Benefits of $1,736.4 million as of January 1, 2017. This includes a decrease of $6.8 million over the Net Assets Available for Benefits of $1,743.2 million as of January 1, 2016. During the prior year, the investment return was 6.8% as reported by the Plan.

Starting with the January 1, 2012 valuation, the Board of Trustees adopted the market value of assets to determine the actuarial value of assets used for funding purposes. This method recognized gains and losses, i.e. the difference between actual investment return during the year and the expected return based on the valuation interest rate, immediately. Starting with the January 1, 2017 valuation, the Board of Trustees adopted an actuarial value of assets to be used for funding purposes. This method recognizes gains and losses over a period of five years. The

Net Assets Available for Benefits on an Actuarial Value basis is $1,752.4 million as of January 1, 2017.

A summary of the assets held for investment, a summary of changes in assets, and the development of the actuarial value of assets is shown in Section 2.

Actuarial Experience

Differences between the expected experience based on the actuarial assumptions and the actual experience create changes in the actuarial accrued liability, actuarial value of assets, and the unfunded actuarial accrued liability from one year to the next. These changes create an actuarial gain if the experience is favorable and an actuarial loss if the experience is unfavorable. The Plan experienced a total net actuarial loss of $20.3 million during the prior year which includes a gain due to the asset method change. This net loss is about 0.6% of the plan's prior year actuarial accrued liability. The net loss is a combination of two principal factors, demographic experience and investment performance.

The demographic experience tracks actual changes in the plan's population compared to the assumptions for decrements such as mortality, turnover, and retirement, as well as pay increases. The Plan experienced a demographic loss of $16.3 million during the year ending December 31, 2016. This loss increased the unfunded actuarial accrued liability by $16.3 million and decreased the funded ratio by 0.26%.

Continued tracking of the demographic experience is warranted in order to confirm the appropriateness of the actuarial assumptions. Details of the demographic, economic, and other assumptions used to value the plan liabilities and normal cost can be found in Section 6. In our opinion, the economic assumptions comply with Actuarial Standards of Practice No. 27 and the demographic assumptions comply with Actuarial Standards of Practice No. 35.

On the asset side, the Plan experienced a loss on a fair value of assets basis. The actual rate of return on the fair value of plan assets was 6.8% for the year ending December 31, 2016 compared to the assumption of 8.25%.

The rate of return on the actuarial value of Plan assets for the year ending December 31, 2016 was approximately 8.0% compared to the assumption of 8.25%, resulting in an asset loss of $20.1 million. The actuarial value of the assets recognizes only 20% of the 2016 unexpected change in fair value, or $4.0 million, delaying the recognition of the remaining 80% over the next four years. The loss, based on the actuarial methodology, increased the unfunded actuarial accrued liability by $4.0 million and decreased the funded ratio by 0.6%. It should be noted that the Plan's assumed asset return of 8.25% is a long-term rate and short-term performance is not necessarily indicative of expected long-term future returns

A summary of the actuarial gains and losses experienced during the prior year is shown in Section 1.4.

Funded Status

The funded status is a measure of the progress that has been made in funding the plan as of the valuation date. It is determined as a ratio of the actuarial value of assets divided by the total actuarial accrued liability on the valuation date. A ratio of over 100% represents a plan that is ahead in funding, and a ratio of less than 100% represents a plan that is behind in funding on the valuation date. The funded ratio presented is appropriate for evaluating the need and level of future contributions but makes no assessment regarding the funded status of the plan if the plan were to settle (i.e. purchase annuities) for a portion or all of its liabilities.

As of January 1, 2017 the funded ratio of the Plan is 52.5%. This represents a decrease of 0.9% from last year's funded ratio of 53.4% as of January 1, 2016. Unless otherwise noted, the funded status shown in the report is based on the projected unit credit cost method.

A history of the unfunded actuarial accrued liability and the funded ratio is shown in Section 1.5.

Statutory Contributions

Actual required contribution rates were determined in accordance with 40 ILCS 5/22-101(e) using the projected unit credit cost method and provide for a funded ratio of at least 60 percent no later than ten years after the valuation year through fiscal year end 2039 and 90 percent funding by fiscal year end 2059. Contribution rates reflect the issuance of bond or notes by the Authority, as defined in 70 ILCS 3605/12c. Authority contribution rates are adjusted by a debt service credit, for debt service paid in the prior year, of up to six percent of compensation per year from 2009 to 2040, as defined in 40 ILCS 5/22-101(e)(2).

Actuarial Math Contributions

While not required by 40 ILCS 5/22-101(e), white papers on funding policies for public sector plans developed over the past few years suggest a funding policy be sufficient to pay the normal cost on the entry age normal cost basis and amortize the unfunded actuarial accrued liability over a fixed period of 20 years. We will broadly refer to this type of policy as an Actuarial Math Funding Policy. Conduent has recommended that the Board of Trustees consider, as appropriate, moving towards contributing based on the Actuarial Math Funding Policy.

Under Actuarial Math, the normal cost represents the cost of the benefits that accrue during the year for active members under the Entry Age Normal Cost Method. It is determined as a level percent of pay over each individual career attributable to the respective plan year. The normal cost for 2017 has been determined to be $52.7 million, or 9.16% of pay. This represents a small increase in the normal cost rate of 0.07% of pay from last year's normal cost rate of 9.09%.

Under Actuarial Math, the cost method under which the actuarial accrued liability is determined is the entry age normal cost method. Under the entry age normal cost method, the actuarial accrued liability (AAL) is equal to the present value of projected benefits less the present value of future benefits to be accrued. The AAL amount is compared to the actuarial value of assets to determine if the Plan is ahead or behind in funding as of the valuation date. The difference between the total actuarial accrued liability and the actuarial value of assets equals the amount of unfunded actuarial accrued liability or surplus (if negative) on the valuation date. This amount is amortized and added to the normal cost to determine the annual required contribution for the year suggested by public sector funding policy white papers.

The unfunded actuarial accrued liability under the entry age normal cost method as of January 1, 2017 is $1,689.9 million. This represents an increase of $57.7 million in the unfunded actuarial accrued liability from last year's amount of $1,632.2 million. The annual payment required to amortize the unfunded actuarial accrued liability of $1,689.9 million as of January 1, 2017 is $140.3 million, or 24.38% of pay.

The total contribution suggested by actuarial math is the sum of the normal cost and the payment to the UAAL plus interest, or 34.89% of pay (9.16% of pay attributable to the normal cost plus 24.38% of pay attributable to the amortization of the unfunded plus 1.35% of pay for the mid-year interest adjustment).

The actuarial liabilities and development of the Actuarial Math Contribution is shown in the Comparative Summary and Section 1.1.

In our opinion, the measurement of the benefit obligations and determination of the actuarial cost of the Plan is performed in compliance with Actuarial Standards of Practice No. 4.

Accounting Information

The Governmental Accounting Standards Board (GASB) issues statements which establish financial reporting standards for defined benefit pension Plans and accounting for the pension expenditures and expenses for governmental employers. The required financial reporting information for the Plan and the Employer under GASB No. 67 can be found in Section 3 beginning on page 22.

Projections

As part of the annual actuarial valuation, a forecast of expected future valuation results is performed over a 50 year period beginning on the valuation date. This analysis provides a dynamic look into the future to identify trends in future employer contributions and funded status. The forecast replaces active members who are assumed to decrement (terminate, retire, etc.) during the period with new members resulting in a stable active membership. The forecast assumes all actuarial assumptions are exactly realized each year during the forecast period. The results of these forecasts can be found in Section 4.

Changes in Plan Provisions

There have been no significant changes in the plan provisions which changed the meaning of the Plan according to Plan Counsel since the last actuarial valuation performed as of January 1, 2016.

Changes in Actuarial Assumptions, Methods, or Procedures

There have been no changes in the actuarial assumptions, actuarial cost method or valuation procedures since the last actuarial valuation performed as of January 1, 2016. The asset valuation method was changed to actuarial value of assets, which smoothes gains or losses over a five year period.

Comparative Summary of Key Actuarial Valuation Results

	January 1, 2017	January 1, 2016
1. Investment Return Assumption	8.25 %	8.25 %
2. Membership Data		
a. Active Employees		
Number	8,129	8,204
Annualized Salaries (in thousands)	575,444	573,548
Average Pay	71,564	70,331
b. Terminated Participants with Vested Benefits		
Number	105	98
Total Monthly Accrued Benefit	235,034	218,349
Average Monthly Accrued Benefit	2,238	2,228
c. Retirees and Beneficiaries		
Number	8,972	8,869
Total Monthly Pension	20,208,745	19,544,615
Average Monthly Pension	2,252	2,204
d. Disability Allowances		
Number	1,178	1,159
Total Monthly Pension	1,628,272	1,559,508
Average Monthly Pension	1,382	1,346
3. Statutory Minimum Contribution Rates (as a percentage of Payroll)[1]		
a. Employer Contribution Rate		
Gross Employer Rate	24.019 %	23.925 %
Credit for Debt Repayment	6.000 %	6.000 %
Net Employer Rate	18.019 %	17.925 %
b. Employee Contribution Rate	12.010 %	11.962 %
4. Actuarial Math Contribution*		
a. Amortization Payment for UAAL		
i. Amount	140,266,284	135,479,896
ii. As a % of pay	24.38 %	23.62 %
b. Normal Cost		
i. Amount	52,692,641	52,159,153
ii. As a % of pay	9.16 %	9.09 %
c. Interest Adjustment to Mid-Year		
i. Amount	7,801,831	7,586,735
ii. As a % of pay	1.35 %	1.32 %
d. Actuarial Contribution		
i. Amount	200,760,757	195,225,784
ii. As a % of pay	34.89 %	34.04 %
5. Actuarial Funded Status ($ in thousands)		
a. Actuarial Accrued Liability	3,338,641	3,267,121
b. Actuarial Value of Assets (AVA)	1,752,473	1,743,216
c. Unfunded Accrued Liability	1,586,168	1,523,905
d. Funded Ratio	52.5 %	53.4 %
e. Market Value of Assets (MVA)	1,736,369	1,743,216
f. Return on MVA (prior year)	6.8 %	(0.2) %
g. Return on AVA (prior year)	6.8 %	(0.2) %

[1] Contribution rate applicable for the plan year following the year of valuation.

Section 1 - Actuarial Funding Results

Section 1.1
Actuarial Liabilities and Normal Cost

Actuarial Accrued Liability	January 1, 2017	January 1, 2016
1. Active Members		
a. Retirement Benefits	980,320,341	976,491,538
b. Withdrawal Benefits	23,371,201	23,630,028
c. Disability Benefits	35,566,344	35,834,510
d. Death Benefits	15,363,864	15,032,557
Total	1,054,621,750	1,050,988,633
2. Inactive Members with Deferred Benefits	15,363,654	13,413,910
3. Retired Members and Beneficiaries Receiving Benefits	2,268,655,910	2,202,718,093
4. Total Actuarial Accrued Liability (1. + 2. + 3.)	3,338,641,314	3,267,120,636

Normal Cost	January 1, 2017	January 1, 2016
1. Active Members		
a. Retirement Benefits	53,827,420	53,679,623
b. Withdrawal Benefits	2,741,907	2,690,808
c. Disability Benefits	2,994,986	2,991,145
d. Death Benefits	1,147,252	1,110,701
2. Normal Cost (Dollar amount)	**60,711,565**	**60,472,277**
3. Total Normal Cost (As a % of pay)	**10.55%**	**10.54%**

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Section 1.2
Actuarial (Gain) / Loss

Development of Actuarial (Gain) / Loss	Amount
1. Expected Actuarial Accrued Liability	
a. Actuarial Accrued Liability at January 1, 2016	3,267,120,636
b. Normal Cost at January 1, 2016	60,472,277
c. Interest on a. + b. to End of Year	274,526,415
d. Benefit Payments and Administrative Expenses for 2016, with Interest to End of Year	279,747,570
e. Expected Actuarial Accrued Liability Before Changes (a. + b. + c. - d.)	3,322,371,758
f. Change in Actuarial Accrued Liability at January 1, 2017 due to	
Change in Actuarial Assumptions	0
g. Change in Actuarial Accrued Liability at January 1, 2017 due to	
Change in Plan Provisions	0
h. Expected Actuarial Accrued Liability at January 1, 2017 (e. + f. + g.)	3,322,371,758
2. Actuarial Accrued Liability at January 1, 2017	3,338,641,314
3. Liability (Gain) / Loss (2. – 1.h.)	16,269,556
4. Expected Actuarial Value of Assets	
a. Actuarial Value of Assets at January 1, 2016	1,743,216,432
b. Interest on a. to End of Year	143,815,356
c. Contributions Made for 2016	143,415,539
d. Interest on c. to End of Year	5,798,663
e. Benefit Payments and Administrative Expenses for 2016, with Interest to End of Year	279,747,570
f. Expected Actuarial Value of Assets at January 1, 2017	
(a. + b. + c. + d. – e.)	1,756,498,420
5. Market Value of Assets as of January 1, 2017	1,736,369,178
6. Market Value Asset (Gain) / Loss (4.f. - 5.)	20,129,242
5. Change in Actuarial Value of Assets due to method change	(16,103,394)
7. Total Actuarial (Gain) / Loss (3. + 6. + 7.)	20,295,404

Section 1.3
Actuarial Balance Sheet

Financial Resources	January 1, 2017	January 1, 2016
1. Actuarial Value of Assets	1,752,472,572	1,743,216,432
2. Present Value of Future Contributions	493,194,512	511,755,531
3. Unfunded Actuarial Accrued Liability/(Reserve)	1,602,272,136	1,523,904,205
4. Total Assets (1 + 2 + 3)	3,847,939,220	3,778,876,168

Benefit Obligations	January 1, 2017	January 1, 2016
1. Present Value of Future Benefits		
a. Active Members	1,563,919,656	1,562,744,165
b. Inactive Members	15,363,654	13,413,910
c. Retirees, disabilities and beneficiaries	2,268,655,910	2,202,718,093
d. Total	3,847,939,220	3,778,876,168

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Section 1.4
Analysis of Financial Experience

Analysis of Actuarial (Gains) and Losses Resulting from Differences Between Assumed Experience and Actual Experience

Type of (Gain) or Loss	Year End December 31, 2016	As a % of Last Year's AAL
(1) COLA Experience	0	0.00%
(2) Salary Experience	(9,706,589)	-0.30%
(3) Retiree Mortality Experience	(5,936,102)	-0.18%
(4) Other (turnover, retirement ages, service purchase, etc.)		
(a) Unexpected Participant Pick Up	11,564,716	0.35%
(b) Unexpected Data Change for Decrementing Actives	9,173,627	0.28%
(c) Unexpected Data Change for Continuing Inactives	(313,246)	-0.01%
(d) Unexpected Rehires	(547,110)	-0.02%
(e) Miscellaneous	7,154,223	0.22%
(f) Total	27,032,210	0.83%
(5) Active Decrements	2,656,574	0.08%
(6) New Entrants	2,223,463	0.07%
(7) Liability (Gain) or Loss During Year, (1) + (2) + (3) + (4)(f) + (5) + (6)	16,269,556	
(8) Investment Experience	20,129,242	0.62%
(8) Asset Valuation Method	(16,103,394)	-0.49%
(10) Assumption and Method Changes	0	0.00%
(11) Benefit Changes	0	0.00%
(12) Other	0	0.00%
(13) Total (Gain) or Loss During Year, (7) + (8) + (9) + (10) + (11) + (12)	20,295,404	0.62%

Section 1.5
History of UAAL and Funded Ratio
($'s in 000's)

Valuation Date	Actuarial Accrued Liability (AAL)	Actuarial Value of Assets (AVA)	Funded Ratio (AVA as a % of AAL)	Unfunded Actuarial Accrued Liability (UAAL)
January 1, 2017	3,338,641	1,752,473	52.49%	1,586,168
January 1, 2016	3,267,121	1,743,216	53.36%	1,523,904
January 1, 2015	3,186,187	1,855,912	58.25%	1,330,275
January 1, 2014	3,105,567	1,892,714	60.95%	1,212,853
January 1, 2013	2,867,335	1,702,788	59.39%	1,164,547
January 1, 2012	2,808,184	1,662,196	59.19%	1,145,988
January 1, 2011	2,724,191	1,909,967	70.11%	814,224
January 1, 2010	2,588,462	1,936,849	74.83%	651,613
January 1, 2009	2,632,356	1,995,953	75.82%	636,403
January 1, 2008	2,531,440	941,864	37.21%	1,589,576

Section 1.6
Solvency Test

Comparative Summary of Accrued Liability and Actuarial Value of Assets

	Accrued Liability for:				Portion of Accrued Liability Covered by Actuarial Value of Assets		
Valuation as of January 1	(1) Active Member Contributions	(2) Retirees, Beneficiaries, TVRs and Disabled	(3) Active Member (Employer Financed Portion)	Actuarial Value of Assets[1]	(1)	(2)	(3)
2017	449,593,044	2,284,019,564	605,028,706	1,752,472,572	100.00 %	57.04 %	0.00 %
2016	417,390,393	2,216,132,003	633,598,241	1,743,216,432	100.00 %	59.83 %	0.00 %
2015	379,907,286	2,166,525,560	639,753,826	1,855,912,051	100.00 %	68.13 %	0.00 %
2014	342,529,743	2,108,016,547	655,020,539	1,892,714,102	100.00 %	73.54 %	0.00 %
2013	306,193,043	1,987,917,394	573,224,876	1,702,787,884	100.00 %	88.36 %	0.00 %

1. Excludes health care assets.

Section 1.7
Projected Actuarial Results

Projection of Funded Status based on Board Approved Contribution Rates

	Board Adopted Contribution Rates			Board Adopted Contributions					
Year	Employee Contribution Percent	Employer Contribution Percent	Total Percent	Employee Contribution	Employer Contribution	Total Contribution	Actuarial Accrued Liability	Actuarial Value of Assets (Market)	Funded Ratio
2017	11.962%	17.925%	29.887%	68,743,666	103,007,096	171,750,762	3,338,641,314	1,752,472,573	52.49%
2018	12.010%	18.019%	30.029%	71,222,750	106,862,845	178,085,595	3,397,375,482	1,787,968,264	52.63%
2019	12.010%	18.019%	30.029%	73,623,303	110,464,643	184,087,946	3,456,977,011	1,826,380,690	52.83%
2020	12.010%	18.019%	30.029%	76,335,347	114,533,802	190,869,149	3,516,029,034	1,867,503,735	53.11%
2021	12.010%	18.019%	30.029%	79,650,650	119,508,093	199,158,743	3,574,742,452	1,912,333,932	53.50%
2022	12.010%	18.019%	30.029%	83,083,308	124,658,464	207,741,772	3,632,885,653	1,966,513,587	54.13%
2023	12.010%	18.019%	30.029%	86,710,226	130,100,303	216,810,529	3,690,551,404	2,026,825,909	54.92%
2024	12.010%	18.019%	30.029%	90,467,092	135,737,118	226,204,210	3,748,316,779	2,094,830,200	55.89%
2025	12.010%	18.019%	30.029%	94,385,961	141,617,001	236,002,962	3,806,104,750	2,171,263,076	57.05%
2026	12.010%	18.019%	30.029%	98,430,160	147,684,931	246,115,091	3,863,414,230	2,256,734,946	58.41%
2027	12.010%	18.019%	30.029%	102,799,442	154,240,615	257,040,057	3,919,421,511	2,351,652,904	60.00%
2028	12.010%	18.019%	30.029%	107,435,234	161,196,173	268,631,407	3,974,724,634	2,458,225,791	61.85%
2029	12.010%	18.019%	30.029%	112,296,094	168,489,423	280,785,517	4,029,833,877	2,578,725,460	63.99%
2030	12.010%	18.019%	30.029%	117,365,337	176,095,332	293,460,669	4,085,551,440	2,715,427,185	66.46%
2031	12.010%	18.019%	30.029%	122,585,711	183,927,997	306,513,708	4,143,387,891	2,871,019,382	69.29%
2032	12.010%	18.019%	30.029%	128,000,050	192,051,689	320,051,739	4,205,202,767	3,048,770,812	72.50%
2033	12.010%	18.019%	30.029%	133,491,348	200,290,850	333,782,198	4,272,529,252	3,251,737,163	76.11%
2034	12.010%	18.019%	30.029%	139,130,356	208,751,636	347,881,992	4,346,669,471	3,482,640,224	80.12%
2035	12.010%	18.019%	30.029%	144,957,314	217,494,424	362,451,738	4,429,591,640	3,745,162,749	84.55%
2036	12.010%	18.019%	30.029%	150,830,830	226,307,066	377,137,896	4,523,111,800	4,043,084,837	89.39%
2037	12.010%	18.019%	30.029%	156,782,358	235,236,758	392,019,116	4,628,630,576	4,379,567,717	94.62%
2038	12.010%	18.019%	30.029%	162,833,055	244,315,242	407,148,297	4,747,387,520	4,757,900,246	100.22%
2039	12.010%	18.019%	30.029%	168,681,043	253,089,583	421,770,626	4,878,853,026	5,180,427,452	106.18%
2040	12.010%	18.019%	30.029%	174,720,009	262,150,467	436,870,476	5,023,232,944	5,649,168,988	112.46%

Section 2 - Plan Assets

Section 2.1
Statement of Net Plan Assets
($'s in 000's)

	As of December 31	
	2016	**2015**
ASSETS		
1. Total investments, at fair value	1,725,220	1,728,747
2. Invested securities lending cash collateral	125,958	192,405
3. Receivables:		
a. Employer contributions	14,318	7,943
b. Employee contributions	10,198	5,652
c. Securities sold, but not received	18,241	4,735
d. Accrued interest and dividends	1,912	2,125
e. Other	1,260	1,420
4. Total assets	1,897,107	1,943,027
LIABILITIES		
1. Payable upon return of securities	125,958	192,405
2. Accounts payable	3,496	3,574
3. Other payables	109	106
4. Securities purchased, but not paid	31,175	3,726
5. Total liabilities	160,738	199,811
Net assets held in trust for Plan benefits	**1,736,369**	**1,743,216**

Section 2.2
Changes in Net Plan Assets
($'s in 000's)

	As of December 31	
	2016	2015
ADDITIONS		
1. Net investment (loss) income	$ 118,614	$ 8,230
2. Employer contributions	83,855	82,800
3. Employee contributions	59,560	58,993
4. Other income	-	-
Total additions	$ 262,029	$ 150,023
DEDUCTIONS		
1. Benefit payments	$ 261,727	$ 253,788
2. Contribution refunds, including interest	4,840	6,354
3. Administrative expenses	2,309	2,577
Total liabilities	$ 268,876	$ 262,719
NET ASSETS HELD IN TRUST FOR PLAN BENEFITS		
1. Beginning of year	$ 1,743,216	$ 1,855,912
2. Net (decrease) increase	(6,847)	(112,696)
End of year	**$ 1,736,369**	**$ 1,743,216**

Section 2.3
Actuarial Value of Assets

Development of Actuarial Value of Assets 8.25%	Amount
1. Actuarial Value of Assets as of January 1, 2016	1,743,216,432
2. Unrecognized Return as of January 1, 2016	-
3. Fair Value of Assets as of January 1,2016	1,743,216,432
4. Contributions	
a. Member (includes purchased service)	59,560,473
b. Employer	83,855,066
c. Miscellaneous contributions	0
d. Total	143,415,539
5. Distributions	
a. Benefit payments	261,727,110
b. Refund of contributions	4,839,864
c. Administrative expenses	2,309,231
d. Total	268,876,205
6. Expected Return at 8.25% on	
a. Item 1.	143,815,356
b. Item 2.	0
c. Item 4.d.	5,798,663
d. Item 5.d.	10,871,365
e. Total [a. + b. + c. – d.]	138,742,654
7. Actual Return on Fair Value for Fiscal Year, Net of Investment Expenses	118,613,412
8. Return to be Spread for Fiscal Year (7. – 6.e) *	(20,129,242)
9. Total Fair Value of Assets as of January 1, 2017	1,736,369,178
10. Return to be Spread	

Fiscal Year	Return to be Spread	Unrecognized Percent	Unrecognized Return
2016	(20,129,242)	80%	(16,103,394)
2015		60%	0
2014		40%	0
2013		20%	0
2012		0%	0
		Total	(16,103,394)

11. Actuarial Value of Assets (9. – 10.)	**1,752,472,572**
12. Recognized Rate of Return for the Year on Actuarial Value of Assets	**8.02%**
13. Rate of Return for the Year on Fair Value of Assets (reported by investment consultant - net of inv. exp	**6.80%**

* Annual Return to be Spread calculation based on assumed 8.25% investment return which includes an assumption that all expenses and revenues are on average paid at mid-year

Section 2.4
Historical Asset Rate of Return

Year Ending December 31	Fair Value Annual Recognized Rate of Return
2016	6.80% [1]
2015	-0.20% [1]
2014	4.80% [1]
2013	19.50% [1]
2012	11.27% [1]

[1] As reported by the Plan.

Section 2.5
Forecast of Expected Benefit Payments

Year Ending December 31	Active Members	Inactive Members	Total Payments
2017	9,986,358	261,450,620	271,436,978
2018	23,130,626	254,900,588	278,031,214
2019	35,852,904	248,740,201	284,593,105
2020	48,580,701	242,490,416	291,071,117
2021	61,756,473	235,919,834	297,676,307
2022	74,787,515	229,300,074	304,087,589
2023	87,479,473	222,378,968	309,858,441
2024	100,324,844	215,404,220	315,729,064
2025	113,706,762	208,250,052	321,956,814
2026	127,859,503	200,831,429	328,690,932
2027	142,504,387	193,177,834	335,682,221
2028	156,642,763	185,325,785	341,968,548
2029	170,215,926	177,391,298	347,607,224
2030	183,000,670	169,359,643	352,360,313
2031	194,479,513	161,231,369	355,710,882
2032	205,212,703	152,948,701	358,161,404
2033	215,373,821	144,646,161	360,019,982
2034	224,403,349	136,276,537	360,679,886
2035	231,877,734	127,953,629	359,831,363
2036	238,027,953	119,702,858	357,730,811
2037	243,176,358	111,521,128	354,697,486
2038	247,247,307	103,453,832	350,701,139
2039	250,131,902	95,523,847	345,655,749
2040	251,959,287	87,799,425	339,758,712
2041	252,777,832	80,320,593	333,098,425
2042	252,840,948	73,124,766	325,965,714
2043	252,119,827	66,243,586	318,363,413
2044	250,893,642	59,704,336	310,597,978
2045	249,167,388	53,534,646	302,702,034
2046	247,115,426	47,756,561	294,871,987
2047	244,591,163	42,406,091	286,997,254
2048	241,685,527	37,438,895	279,124,422
2049	238,231,425	32,877,047	271,108,472
2050	234,352,673	28,713,985	263,066,658
2051	229,978,576	24,938,014	254,916,590
2052	224,766,792	21,534,581	246,301,373
2053	218,707,111	18,487,174	237,194,285
2054	211,927,212	15,776,219	227,703,431
2055	204,599,614	13,379,094	217,978,708
2056	196,645,158	11,271,291	207,916,449
2057	188,210,631	9,430,271	197,640,902
2058	179,380,396	7,833,624	187,214,020
2059	170,341,731	6,459,680	176,801,411
2060	161,174,916	5,286,436	166,461,352
2061	151,963,203	4,292,579	156,255,782
2062	142,779,719	3,457,296	146,237,015
2063	133,679,486	2,761,975	136,441,461
2064	124,721,850	2,189,639	126,911,489
2065	115,957,481	1,723,613	117,681,094
2066	107,418,324	1,347,692	108,766,016
2067	99,143,064	1,047,347	100,190,411
2068	91,158,618	809,303	91,967,921
2069	83,494,205	622,250	84,116,455

Section 2.5
Forecast of Expected Benefit Payments, continued

Year Ending December 31	Active Members	Inactive Members	Total Payments
2070	76,166,947	476,326	76,643,273
2071	69,187,751	363,400	69,551,151
2072	62,555,620	276,627	62,832,247
2073	56,271,375	210,493	56,481,868
2074	50,336,593	160,312	50,496,905
2075	44,753,154	122,365	44,875,519
2076	39,522,274	93,791	39,616,065
2077	34,646,930	72,320	34,719,250
2078	30,132,609	56,191	30,188,800
2079	25,981,267	44,091	26,025,358
2080	22,196,522	35,004	22,231,526
2081	18,774,943	28,133	18,803,076
2082	15,711,158	22,867	15,734,025
2083	12,997,808	18,787	13,016,595
2084	10,626,627	15,552	10,642,179
2085	8,580,584	12,940	8,593,524
2086	6,838,890	10,773	6,849,663
2087	5,378,015	8,939	5,386,954
2088	4,172,026	7,351	4,179,377
2089	3,192,142	5,940	3,198,082
2090	2,408,812	4,680	2,413,492
2091	1,792,224	3,617	1,795,841
2092	1,314,519	2,741	1,317,260
2093	950,626	2,023	952,649
2094	677,390	1,456	678,846
2095	475,524	1,013	476,537
2096	328,651	683	329,334
2097	223,851	442	224,293
2098	150,274	278	150,552
2099	99,509	167	99,676
2100	64,986	100	65,086
2101	41,868	60	41,928
2102	26,618	36	26,654
2103	16,682	21	16,703
2104	10,326	13	10,339
2105	6,309	8	6,317
2106	3,789	5	3,794
2107	2,237	3	2,240
2108	1,302	2	1,304
2109	742	1	743
2110	405	1	406
2111	209	0	209
2112	103	0	103
2113	49	0	49
2114	23	0	23

Note: Forecast based on the present members w ithout assumption about replacement members

Section 3 - Accounting Information

Section 3.1
Actuarial Methods and Assumptions for GASB 67/68 Disclosure Purposes

The total pension liability as of December 31, 2016 was determined by rolling forward the total pension liability as of January 1, 2016 to December 31, 2016 using the following actuarial methods and assumptions, applied to all periods included in the measurement. All other assumptions such as retirement rates, termination rates, and disability rates used to determine the total pension liability are set forth in Section 6 - Basis of the Actuarial Valuation.

Valuation Date:	January 1, 2016
Actuarial Cost Method:	Entry Age Normal – Level Percentage of Pay
Amortization Method:	For pension expense; the difference between expected and actual liability experience and changes of assumptions are amortized over the average of the expected remaining service lives of all members. The difference between projected and actual earnings is amortized over a closed period of five years.
Mortality:	Healthy pensioners: RP2000 Blue Collar Table, base year 2000 fully generational based on Scale BB Active members: RP2000 Blue Collar Table, base year 2000 fully generational based on Scale BB.
Experience Study:	The actuarial assumptions used were based on the results of an actuarial experience study for the period January 1, 2008 through December 31, 2012.

Section 3.2
Schedule of Expected Changes in Net Pension Liability as of December 31, 2016

The GASB Statement No. 67 Change in Net Pension Liability

Schedule of Changes in Net Pension Liability		
Fiscal Year Ending	**Dec. 31, 2016**	**Dec. 31, 2015**
Total Pension Liability		
Service Cost	$ 50,111,555	$ 51,357,649
Interest	269,898,773	264,578,983
Changes of Benefit Terms	-	-
Difference between Expected and Actual Experience	51,517,654	13,082,408
Change of Assumptions	-	-
Benefit Payments, including Refund of Member Contributions	(266,566,974)	(260,141,627)
Net Change in Total Pension Liability	104,961,009	68,877,413
Total Pension Liability - Beginning of Year	$ 3,352,031,110	$ 3,283,153,697
Total Pension Liability - End of Year	$ 3,456,992,119	$ 3,352,031,110
Plan Fiduciary Net Position		
Employer Contributions	$ 83,855,066	$ 82,799,918
Member Contributions	59,560,473	58,993,284
Net Investment Income	118,613,412	8,230,003
Benefit Payments, including Refund of Member Contributions	(266,566,974)	(260,141,627)
Administrative Expenses	(2,309,231)	(2,577,197)
Other	-	-
Net Change in Plan Fiduciary Net Position	(6,847,254)	(112,695,619)
Plan Fiduciary Net Position - Beginning of Year	$ 1,743,216,432	$ 1,855,912,051
Plan Fiduciary Net Position - End of Year	$ 1,736,369,178	$ 1,743,216,432

Section 3.3
Net Pension Liability (Asset)

The GASB Statement No. 67 Net Pension Liability

Net Pension Liability (Asset)		
Valuation Date	**Dec. 31, 2016**	**Dec. 31, 2015**
Total Pension Liability	$ 3,456,992,119	$ 3,352,031,110
Plan Fiduciary Net Position	1,736,369,178	1,743,216,432
Net Pension Liability (Asset)	$ 1,720,622,941	$ 1,608,814,678
Plan Fiduciary Net Position as a Percentage of the Total Pension Liability (Asset)	50.23%	52.00%

Section 3.4
Sensitivity

The GASB Statement No. 67 Sensitivity of Net Pension Liability

Sensitivity of the Net Pension Liability to Changes in the Discount Rate			
December 31, 2016	**1% Decrease**	**Current**	**1% Increase**
Discount Rate	7.25%	8.25%	9.25%
Net Pension Liability (Asset)	$ 2,057,958,512	$ 1,720,622,941	$ 1,431,879,254

The discount rate used to measure the total pension liability was 8.25%. The projection of cash flows used to determine the discount rate assumed that the System's contributions will continue to follow the current funding policy. Based on those assumptions, the System's fiduciary net position was projected to be available to make all projected future benefit payments of current plan members.

Section 3.5
Pension Expense

The GASB Statement No. 68 Pension Expense

Pension Expense		
Measurement Year Ending	**Dec. 31, 2016**	**Dec. 31, 2015**
Service Cost	$ 50,111,555	$ 51,357,649
Interest	269,898,773	264,578,983
Difference between Expected and Actual Experience	14,368,203	2,894,338
Change of Assumptions	-	-
Member Contributions	(59,560,473)	(58,993,284)
Projected Earnings on Plan Investments	(138,742,654)	(148,223,407)
Difference between Expected and Actual Earnings	48,055,795	44,029,946
Administrative Expense	2,309,231	2,577,197
Other	-	-
Changes of Benefit Terms	-	-
Total Pension Expense	186,440,430	158,221,423

Section 3.6
Supporting Exhibits

Schedule of Deferred Inflows and Outflows

Amortization of the Difference Between Expected and Actual Experience

Measurement Date	2014	2015	2016	2017	2018	2019	Outflows	Inflows	Total
Amount Established	$ -	$ 13,082,408	$ 51,517,654						
Recognition Period	-	4.52	4.49						
Amount Recognized in FY									
2014	$ -						$ -	$ -	$ -
2015	-	$ 2,894,338					2,894,338	-	2,894,338
2016	-	2,894,338	$ 11,473,865				14,368,203	-	14,368,203
2017	-	2,894,338	11,473,865				14,368,203	-	14,368,203
2018	-	2,894,338	11,473,865				14,368,203	-	14,368,203
2019	-	1,505,056	11,473,865				12,978,921	-	12,978,921
2020	-	-	5,622,194				5,622,194	-	5,622,194
Deferred Balance at 12/31									
2014	-						$ -	$ -	$ -
2015	-	$ 10,188,070					10,188,070	-	10,188,070
2016	-	7,293,732	$ 40,043,789				47,337,521	-	47,337,521
2017	-	4,399,394	28,569,924				32,969,318	-	32,969,318
2018	-	1,505,056	17,096,059				18,601,115	-	18,601,115
2019	-	-	5,622,194				5,622,194	-	5,622,194
2020	-	-	-				-	-	-

Amortization of Changes in Assumptions

Measurement Date	2014	2015	2016	2017	2018	2019	Outflows	Inflows	Total
Amount Established	$ -	$ -	$ -						
Recognition Period									
Amount Recognized in FY									
2014							$ -	$ -	$ -
2015	-	$ -					-	-	-
2016	-	-	$ -				-	-	-
2017	-	-	-				-	-	-
2018	-	-	-				-	-	-
2019	-	-	-				-	-	-
2020	-	-	-				-	-	-
Deferred Balance at 12/31									
2014	$ -						$ -	$ -	$ -
2015	-	$ -					-	-	-
2016	-	-	$ -				-	-	-
2017	-	-	-				-	-	-
2018	-	-	-				-	-	-
2019	-	-	-				-	-	-
2020	-	-	-				-	-	-

Amortization of the Difference Between Projected and Actual Earnings

Measurement Date	2014	2015	2016	2017	2018	2019	Outflows	Inflows	Total
Amount Established	$ 80,156,326	$ 139,993,404	20,129,242						
Recognition Period	5.00	5.00	5.00						
Amount Recognized in FY									
2014	$ 16,031,265						$ 16,031,265	$ -	$ 16,031,265
2015	16,031,265	$ 27,998,681					44,029,946	-	44,029,946
2016	16,031,265	27,998,681	4,025,849				48,055,795	-	48,055,795
2017	16,031,265	27,998,681	4,025,849				48,055,795	-	48,055,795
2018	16,031,265	27,998,681	4,025,849				48,055,795	-	48,055,795
2019	-	27,998,681	4,025,849				32,024,530	-	32,024,530
2020	-	-	4,025,846				4,025,846	-	4,025,846
Deferred Balance at 12/31									
2014	$ 64,125,061						$ 64,125,061	$ -	$ 64,125,061
2015	48,093,796	$ 111,994,723					160,088,518	-	160,088,518
2016	32,062,530	83,996,042	$ 16,103,393				132,161,966	-	132,161,966
2017	16,031,265	55,997,361	12,077,544				84,106,171	-	84,106,171
2018	-	27,998,681	8,051,695				36,050,376	-	36,050,376
2019	-	-	4,025,846				4,025,846	-	4,025,846
2020	-	-	-				-	-	-

Schedule of CTA Contributions

	2016	2015	2014	2013	2012	2011	2010	2009	2008	2007
Employer Portion of Required Contribution on a statutory basis	$ 82,001	$ 81,731	$ 80,488	$ 102,800	$ 61,982	$ 55,976	$ 56,474	$ 34,030	$ 53,473	$ 51,418
Actual Employer Contributions	$ 83,855	$ 82,800	$ 82,268	$ 79,518	$ 62,788	$ 60,318	$ 56,216	$ 41,448	$ 1,165,947	$ 25,038
Contribution deficiency (excess)	$ (1,854)	$ (1,069)	$ (1,780)	$ 23,282	$ (806)	$ (4,342)	$ 258	$ (7,418)	$ (1,112,474)	$ 26,380
Covered-employee payroll	$ 575,444	$ 573,548	$ 564,827	$ 550,616	$ 548,515	$ 541,354	$ 528,288	$ 567,173	$ 594,139	$ 571,314
Contributions as a percentage of covered-employee payroll	14.25%	14.25%	14.25%	18.67%	11.30%	10.34%	10.69%	6.00%	9.00%	9.00%

Notes to Schedule -

Valuation Date: Actuarially determined contribution rates are calculated as of January 1, one year prior to the end of the fiscal year in which contributions are reported

Projection of Fiduciary Net Position

Year	Projected Beginning Fiduciary Net Position (a)	Projected Total Contributions* (b)	Projected Benefit Payments (c)	Projected Administrative Expense (d)	Projected Investment Earnings (e)	Projected Ending Fiduciary Net Position (f) = (a) + (b) - (c) - (d) + (e)
12/31/2016	1,736,369,178	171,982,914	271,448,635	2,400,000	139,131,761	1,773,635,218
12/31/2017	1,773,635,218	174,026,824	278,042,045	2,448,000	142,020,321	1,809,192,318
12/31/2018	1,809,192,318	176,696,133	284,603,597	2,496,960	144,794,428	1,843,582,322
12/31/2019	1,843,582,322	179,826,692	291,081,653	2,546,899	147,494,236	1,877,274,698
12/31/2020	1,877,274,698	183,782,948	297,686,949	2,597,837	150,164,690	1,910,937,550
12/31/2021	1,910,937,550	187,844,587	304,097,824	2,649,794	152,844,789	1,944,879,308
12/31/2022	1,944,879,308	192,263,576	309,869,052	2,702,790	155,588,167	1,980,159,209
12/31/2023	1,980,159,209	196,759,166	315,740,330	2,756,846	158,440,950	2,016,862,149
12/31/2024	2,016,862,149	201,204,752	321,968,571	2,811,983	161,394,636	2,054,680,983
12/31/2025	2,054,680,983	205,720,376	328,703,147	2,868,222	164,422,698	2,093,252,688
12/31/2026	2,093,252,688	210,570,773	335,694,360	2,925,587	167,515,986	2,132,719,500
12/31/2027	2,132,719,500	215,894,885	341,980,558	2,984,098	170,730,732	2,174,380,461
12/31/2028	2,174,380,461	221,741,002	347,619,321	3,043,780	174,173,732	2,219,632,094
12/31/2029	2,219,632,094	227,963,265	352,372,189	3,104,656	177,963,942	2,270,082,456
12/31/2030	2,270,082,456	234,690,989	355,722,408	3,166,749	182,260,148	2,328,144,436
12/31/2031	2,328,144,436	241,935,919	358,173,322	3,230,084	187,241,535	2,395,918,484
12/31/2032	2,395,918,484	249,254,069	360,031,683	3,294,686	193,051,035	2,474,897,219
12/31/2033	2,474,897,219	256,984,256	360,690,986	3,360,579	199,850,010	2,567,679,920
12/31/2034	2,567,679,920	265,295,209	359,841,689	3,427,791	207,872,238	2,677,577,887
12/31/2035	2,677,577,887	274,070,272	357,740,743	3,496,347	217,375,794	2,807,786,863
12/31/2036	2,807,786,863	283,185,109	354,706,900	3,566,274	228,606,410	2,961,305,209
12/31/2037	2,961,305,209	292,688,398	350,710,181	3,637,599	241,814,631	3,141,460,458
12/31/2038	3,141,460,458	302,113,591	345,664,047	3,710,351	257,259,611	3,351,459,262
12/31/2039	3,351,459,262	312,149,923	339,766,520	3,784,558	275,225,759	3,595,283,866
12/31/2040	3,595,283,866	322,709,079	333,105,815	3,860,249	296,034,472	3,877,061,352
12/31/2041	3,877,061,352	333,781,209	325,972,868	3,937,454	320,014,072	4,200,946,310
12/31/2042	4,200,946,310	345,204,488	318,370,185	4,016,203	347,500,666	4,571,265,075
12/31/2043	4,571,265,075	357,059,821	310,604,577	4,096,528	378,842,042	4,992,465,834
12/31/2044	4,992,465,834	369,263,478	302,708,588	4,178,458	414,400,472	5,469,242,738
12/31/2045	5,469,242,738	381,557,417	294,878,358	4,262,027	454,544,861	6,006,204,631
12/31/2046	6,006,204,631	394,178,680	287,003,535	4,347,268	499,669,481	6,608,701,989
12/31/2047	6,608,701,989	407,152,092	279,130,760	4,434,213	550,214,863	7,282,503,970
12/31/2048	7,282,503,970	419,993,364	271,114,529	4,522,897	606,643,264	8,033,503,172
12/31/2049	8,033,503,172	433,447,355	263,072,621	4,613,355	669,466,175	8,868,730,726
12/31/2050	8,868,730,726	447,407,969	254,922,368	4,705,622	739,262,718	9,795,773,423
12/31/2051	9,795,773,423	461,946,824	246,306,812	4,799,735	816,676,128	10,823,289,828
12/31/2052	10,823,289,828	477,043,661	237,199,316	4,895,730	902,420,995	11,960,659,438

*The contributions displayed include both employee and employer contributions

Actuarial Present Value of Projected Benefit Payments

Year	Projected Beginning Fiduciary Net Position	Projected Benefit Payments	Funded Portion of Projected Benefit Payments	Unfunded Portion of Projected Benefit Payments	8.25% Present Value of Funded Benefit Payments	3.71% Present Value of Unfunded Benefit Payments	8.25% Present Value of Benefit Payments Using Single Discount Rate
12/31/2016	1,736,369,178	271,448,635	271,448,635	-	250,760,864	-	250,760,864
12/31/2017	1,773,635,218	278,042,045	278,042,045	-	237,276,465	-	237,276,465
12/31/2018	1,809,192,318	284,603,597	284,603,597	-	224,365,806	-	224,365,806
12/31/2019	1,843,582,322	291,081,653	291,081,653	-	211,984,063	-	211,984,063
12/31/2020	1,877,274,698	297,686,949	297,686,949	-	200,272,016	-	200,272,016
12/31/2021	1,910,937,550	304,097,824	304,097,824	-	188,993,071	-	188,993,071
12/31/2022	1,944,879,308	309,869,052	309,869,052	-	177,902,835	-	177,902,835
12/31/2023	1,980,159,209	315,740,330	315,740,330	-	167,458,354	-	167,458,354
12/31/2024	2,016,862,149	321,968,571	321,968,571	-	157,747,445	-	157,747,445
12/31/2025	2,054,680,983	328,703,147	328,703,147	-	148,773,237	-	148,773,237
12/31/2026	2,093,252,688	335,694,360	335,694,360	-	140,357,974	-	140,357,974
12/31/2027	2,132,719,500	341,980,558	341,980,558	-	132,088,971	-	132,088,971
12/31/2028	2,174,380,461	347,619,321	347,619,321	-	124,034,112	-	124,034,112
12/31/2029	2,219,632,094	352,372,189	352,372,189	-	116,147,791	-	116,147,791
12/31/2030	2,270,082,456	355,722,408	355,722,408	-	108,316,009	-	108,316,009
12/31/2031	2,328,144,436	358,173,322	358,173,322	-	100,750,394	-	100,750,394
12/31/2032	2,395,918,484	360,031,683	360,031,683	-	93,554,856	-	93,554,856
12/31/2033	2,474,897,219	360,690,986	360,690,986	-	86,583,074	-	86,583,074
12/31/2034	2,567,679,920	359,841,689	359,841,689	-	79,796,029	-	79,796,029
12/31/2035	2,677,577,887	357,740,743	357,740,743	-	73,284,192	-	73,284,192
12/31/2036	2,807,786,863	354,706,900	354,706,900	-	67,124,897	-	67,124,897
12/31/2037	2,961,305,209	350,710,181	350,710,181	-	61,310,444	-	61,310,444
12/31/2038	3,141,460,458	345,664,047	345,664,047	-	55,822,900	-	55,822,900
12/31/2039	3,351,459,262	339,766,520	339,766,520	-	50,688,666	-	50,688,666
12/31/2040	3,595,283,866	333,105,815	333,105,815	-	45,907,600	-	45,907,600
12/31/2041	3,877,061,352	325,972,868	325,972,868	-	41,500,748	-	41,500,748
12/31/2042	4,200,946,310	318,370,185	318,370,185	-	37,443,717	-	37,443,717
12/31/2043	4,571,265,075	310,604,577	310,604,577	-	33,746,327	-	33,746,327
12/31/2044	4,992,465,834	302,708,588	302,708,588	-	30,381,940	-	30,381,940
12/31/2045	5,469,242,738	294,878,358	294,878,358	-	27,340,456	-	27,340,456
12/31/2046	6,006,204,631	287,003,535	287,003,535	-	24,582,282	-	24,582,282
12/31/2047	6,608,701,989	279,130,760	279,130,760	-	22,085,881	-	22,085,881
12/31/2048	7,282,503,970	271,114,529	271,114,529	-	19,816,727	-	19,816,727
12/31/2049	8,033,503,172	263,072,621	263,072,621	-	17,763,432	-	17,763,432
12/31/2050	8,868,730,726	254,922,368	254,922,368	-	15,901,250	-	15,901,250
12/31/2051	9,795,773,423	246,306,812	246,306,812	-	14,192,923	-	14,192,923
12/31/2052	10,823,289,828	237,199,316	237,199,316	-	12,626,441	-	12,626,441

Section 4 - Actuarial Funding Projections

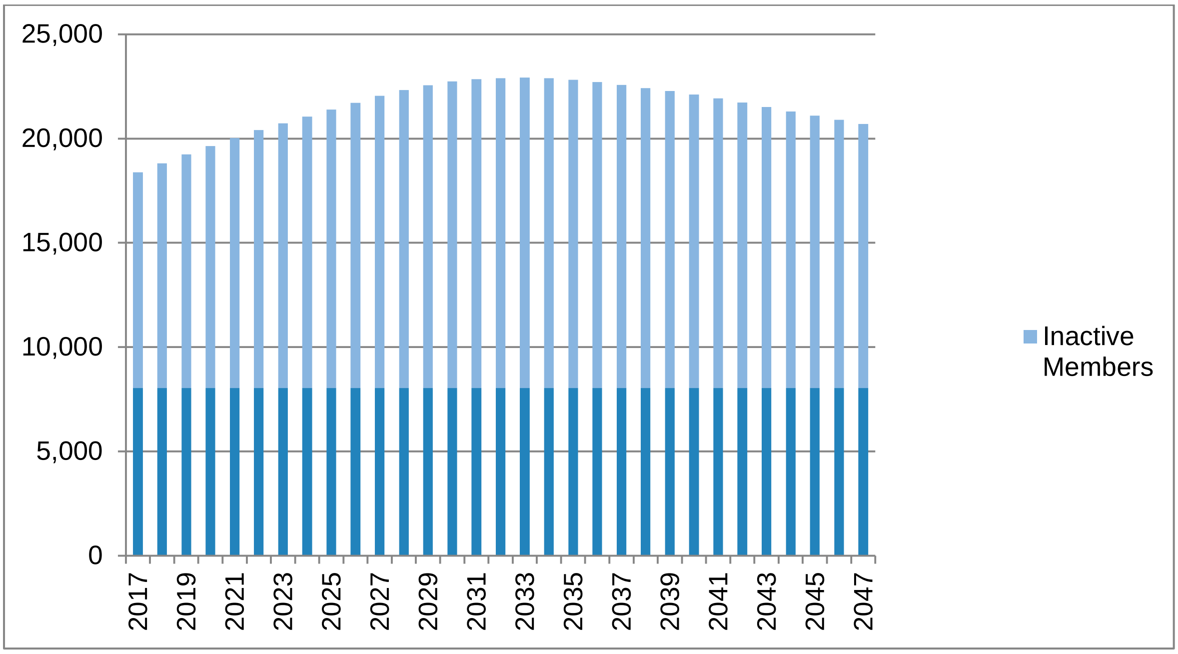
Section 4.1
Projection Assumptions and Methods

Key Assumptions

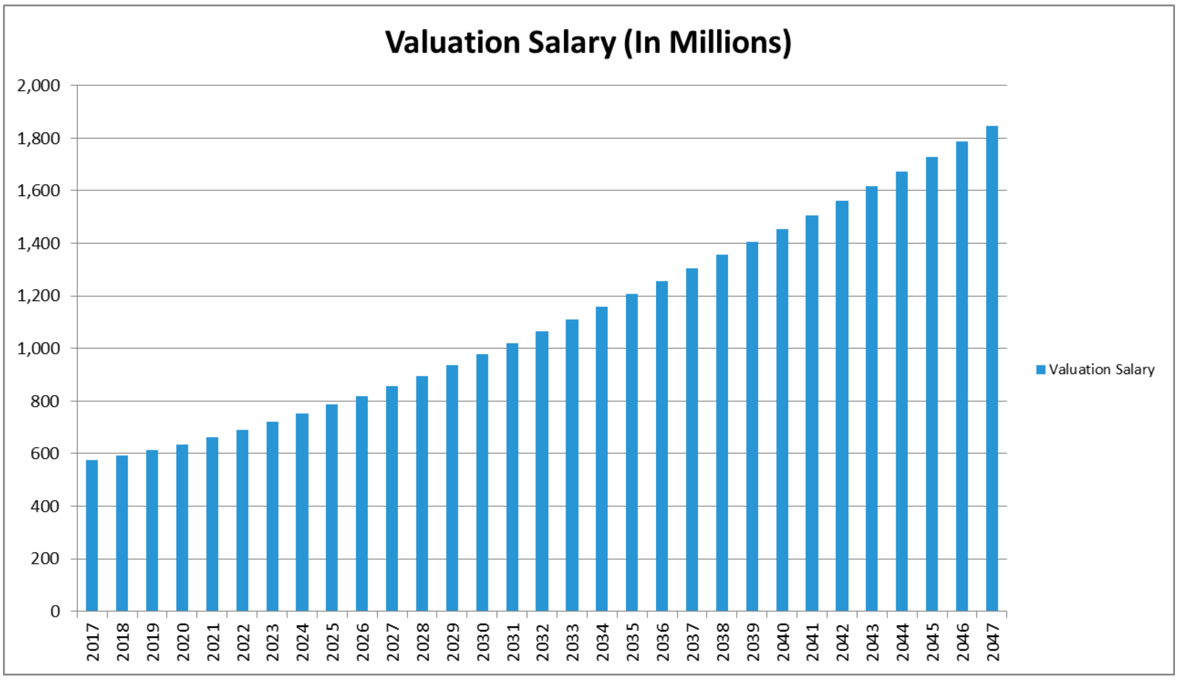
- 8.25% investment return on the Fair Value of Assets in all future years.
- The Actuarial Value of Assets is based on a five-year smoothing method.
- Actuarial assumptions and methods as described in Section 6. All future demographic experience is assumed to be exactly realized.
- The actuarially calculated contribution is contributed each year.
- Projections assume a 0% increase in the total active member population. All new future members are expected to enter the plan after 12 months of continuous service and contribution rates are determined as a percent of total payroll.

Section 4.2
Membership Projection

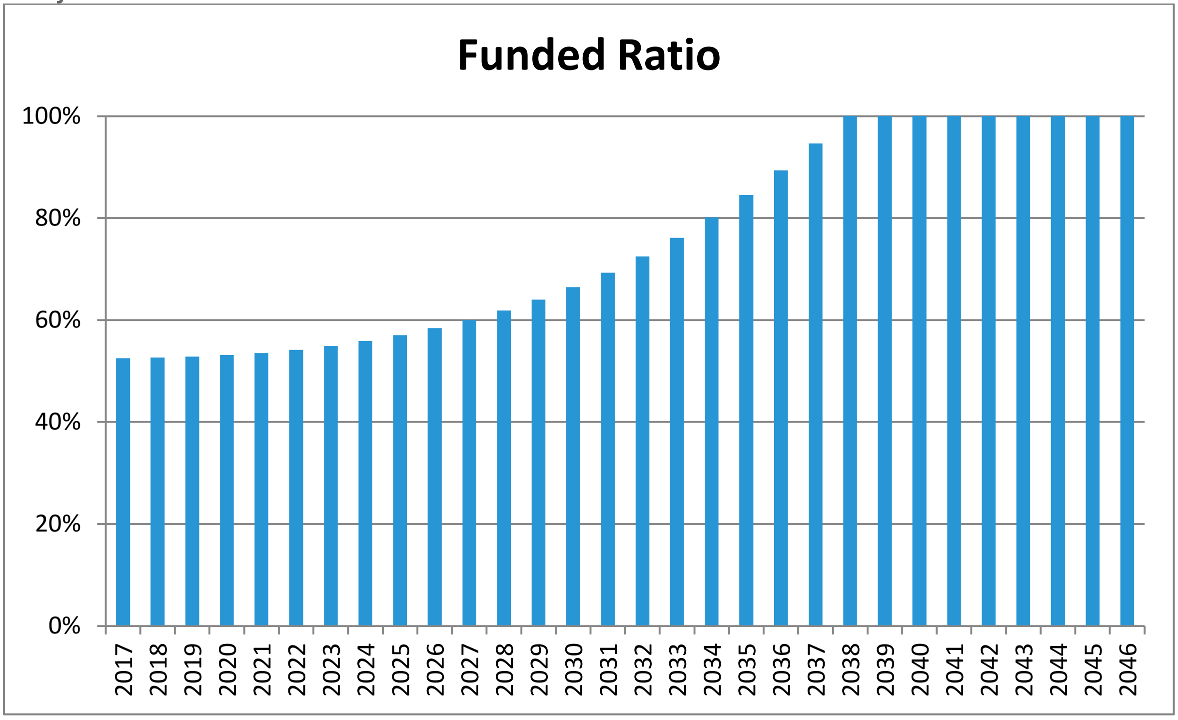
Projected Member Count



Projected Current and New Member Payroll



Section 4.3
Projection of Funded Status



Section 5 - Member Data

Section 5.1
Summary of Membership Data as of January 1, 2017
($ in 000's)

Active Employees

Item	Male	Female	Total
Number of Members [1]	5,708	2,421	8,129
Annual Salaries [2]	$424,366	$151,078	$575,444
Average Age [1]	48.93	47.81	48.59
Average Service [1]	14.01	12.56	13.58

Terminated Vested Employees

Item	Male	Female	Total
Number of Members	76	29	105
Annual Accrued Benefit	$2,012	$808	$2,820
Average Age	56.59	57.21	56.76

Retirees and Beneficiaries

Item	Male	Female	Total
Number of Members	6,640	2,332	8,972
Annual Retirement Benefit	$194,206	$48,299	$242,505
Average Age	71.11	71.49	71.21

Disability Allowances

Item	Male	Female	Total
Number of Members	656	522	1,178
Annual Disability Benefit	$11,718	$7,822	$19,540
Average Age	63.89	62.34	63.20

[1] Active statistics include all participants who are actively employed which includes 16 participants who are on leave and 88 participants who have opted out of participating in the Plan and are only entitled to a return of their contributions.
[2] The salary information for the 88 participants who have opted out of participating in the Plan is not included.

Section 5.2
Age and Service Distribution of Active Members as of January 1, 2017

Number of Participants

	Years of Service									
Age	Under 5	5-9	10-14	15-19	20-24	25-29	30-34	35-39	Over 40	Total
Under 25	20	1	-	-	-	-	-	-	-	21
25-29	202	16	1	-	-	-	-	-	-	219
30-34	332	155	67	7	-	-	-	-	-	561
35-39	293	165	279	120	2	-	-	-	-	859
40-44	282	150	256	289	87	2	-	-	-	1,066
45-49	299	162	329	419	285	80	1	-	-	1,575
50-54	243	109	260	405	330	189	39	-	-	1,575
55-59	193	105	185	363	238	180	72	17	-	1,353
60-64	89	57	99	161	133	96	37	21	10	703
Over 65	17	16	38	40	30	25	6	12	13	197
Total	1,970	936	1,514	1,804	1,105	572	155	50	23	8,129

CONDUENT

Section 5.3
Retirement Retiree and Beneficiary Data as of January 1, 2017

Number and Average Annual Allowance

Age Last Birthday	Number	Annual Allowance	Average Allowance
Retired Annuitants			
Under 50	42	$1,723,408	$41,034
50-54	229	$9,680,438	$42,273
55-59	500	$19,630,711	$39,261
60-64	1,160	$40,840,189	$35,207
65-69	2,016	$60,249,412	$29,886
70-74	1,911	$51,901,797	$27,159
75-79	1,177	$28,609,794	$24,307
Over 79	1030	$19,241,439	$18,681
Total	8,065	$231,877,188	$28,751
Surviving Spouses			
Under 50	9	$88,957	$9,884
50-54	12	$190,461	$15,872
55-59	37	$521,733	$14,101
60-64	59	$883,374	$14,972
65-69	125	$2,099,967	$16,800
70-74	164	$2,053,374	$12,521
75-79	141	$1,567,188	$11,115
Over 79	360	$3,222,701	$8,952
Total	907	$10,627,755	$11,718
Disability Allowances			
Under 50	132	$1,978,484	$14,988
50-54	123	$2,484,809	$20,202
55-59	200	$3,867,287	$19,336
60-64	192	$3,670,497	$19,117
65-69	216	$3,325,512	$15,396
70-74	164	$2,328,336	$14,197
75-79	96	$1,190,684	$12,403
Over 79	55	$693,652	$12,612
Total	1,178	$19,539,261	$16,587

Section 5.4
Inactive Vested Employee Data as of January 1, 2017

Number and Average Accrued Benefit

Age Last Birthday	Number	Annual Accrued Benefit	Average Accrued Benefit
Terminated Vested			
Under 35	1	$27,655	$27,655
35-39	-	-	-
40-44	3	$70,270	$23,423
45-49	8	$161,674	$20,209
50-54	20	$658,556	$32,928
55-59	42	$1,109,152	$26,408
60-64	31	$793,106	$25,584
65-69	-	-	-
Over 70	-	-	-
Total	105	$2,820,413	$26,861

Section 6 - Basis of the Actuarial Valuation

Section 6.1
Summary of Plan and Contribution Provisions

Eligibility—All full-time permanent employees of the Chicago Transit Authority are included in the Plan after completing 12 months of continuous service unless specifically excluded by the terms of a collective bargaining agreement. Exempt non-vested employees may opt out of the plan. Chicago Transit Authority Board members are not included.

Contributions—The Chicago Transit Authority will contribute a percent of compensation for all participating employees and each participating employee will contribute a percent of his compensation to the Plan:

Annual Contributions to the Plan (Percentage of Compensation)	
Authority	**Employees**
18.019%	12.010%

For years through 2040, the amount paid by the Authority with respect to debt service on bonds issued for contribution to the Retirement Plan shall be treated as a credit against the amount of required contribution up to an amount not to exceed six percent of compensation paid by the Authority in the following year. The amount paid in debt service is always greater than six percent of projected compensation.

In order to be eligible for the credit, the debt service payment may not be paid with the proceeds of bonds or notes issued by the CTA for any calendar year after 2008. Conduent has confirmed that the debt service payment for the year triggering the credit was not paid with the proceeds of bonds or notes issued by the CTA for any calendar year after 2008.

Minimum contributions as set forth elsewhere in this report may also apply.

Normal Retirement—The normal retirement age is 65. For employees retiring on or after January 1, 2001 the annual normal retirement pension is equal to the sum of (a) and (b) below, but not greater than 70.0% of the employee's average annual compensation:

(a) 1% of the employee's past service compensation as of May 31, 1948, for each full year of continuous service prior to June 1, 1949, plus

(b) 2.15% of average annual compensation for each year (and fraction of completed calendar months) of continuous service after June 1, 1949.

Average annual compensation is equal to the highest average compensation over any four calendar years out of the final 10 calendar years prior to normal retirement (or actual retirement, if later). If an employee has at least 20 years of service, his minimum annual pension is $2,220.

Early Retirement:

Employees hired before January 18, 2008: An employee may retire early after attaining age 55 and completing at least three years of continuous service, or after completion of 25 years of continuous service. The early retirement pension is equal to the accrued normal retirement pension based on compensation and service at early retirement, reduced by 5% for each year or fraction younger than age 65. The 5% per year reduction is not applied if the employee has at least 25 years of service. Employees hired after September 5, 2001 may retire early with unreduced benefits after attaining age 55 and completing at least 25 years of service.

Employees hired on and after January 18, 2008: An employee may retire with unreduced benefits upon attainment of age 64 with 25 years of service. An employee may retire with a benefit reduced as described above upon attainment of age 55 with 10 years of continuous service.

Disability Allowance:

An employee is eligible for a disability allowance if he becomes disabled after completing 10 years of service, or if his disability after completing five years of service is covered under the Workmen's Compensation Act. An employee is disabled if he either (a) is totally and permanently disabled or (b) is unable to return to work at their same job after receiving 26 weeks of benefits under the Authority's Group Accident and Sickness Insurance or from the Authority under the Workmen's Compensation Act. The disability allowance is equal to the normal retirement pension based on compensation and service at disability subject to a minimum annual pension of $4,800.

Death Benefits:

If an employee dies prior to retirement or disability and after one year of service, his contributions, accumulated with interest, are paid to his beneficiary. "Interest" is equal to the rate of interest earned by the Fund (to a maximum of 2%) prior to January 1, 1971, 1/2 of the rate of interest earned by the Fund (to a maximum of 3%) between January 1, 1971, and January 1, 1980, and 3% after December 31, 1979. If an employee dies after 90 days of service but prior to one year of service, his contributions, without interest, are paid to his beneficiary; and if he dies prior to 90 days of service, his contributions are not refunded.

If an employee is eligible for early retirement, he is automatically covered by a surviving spouse benefit, payable upon his death prior to retirement, in lieu of a return of his contributions. The spouse benefit is equal to 1/2 of the pension which would have been payable to the employee if he had retired on the first day of the month of his death and had elected an optional form of pension providing 1/2 of his reduced pension to his surviving spouse. Employees may elect not to be covered by this option and provide for the payment of their contributions with interest to their beneficiary in lieu thereof.

If an employee dies after his retirement pension has commenced, his beneficiary receives the excess, if any, of his contributions, accumulated with interest to his retirement date, over the sum of the pension payments made to him. However, if his surviving spouse is entitled to a pension after his death, such excess will not be paid to his beneficiary. At the death of the surviving spouse, the excess, if any, of the contributions accumulated with interest to his retirement date over the sum of the pension payments made to him and his surviving spouse will be paid.

Section 6.1
Summary of Plan and Contribution Provisions, continued

A retired employee's beneficiary will receive a death benefit equal to the amount from the following schedule according to the employee's age and service at retirement:

Age	Service	Age + Service	Death Benefit
65	20	N/A	$8,000
60	N/A	90	$8,000
N/A	25	N/A	$8,000
N/A	N/A	94	$8,000
60-64	20	N/A	$6,000
55-59	20	N/A	$5,000
All Others			$2,000

Termination Benefits:

If an employee terminates his employment prior to eligibility for retirement or disability and after completing one year of service, he receives a refund of his contributions plus interest (3% after December 31, 1979). If he terminates after 90 days but prior to one year, he receives his contributions without interest, and if he terminates less than 90 days after hire, he receives no refund. If an employee has completed 10 years of continuous service and elects to leave his contributions in the Plan, he remains entitled to his normal retirement pension beginning at age 65 but based on his compensation and service at termination.

Optional Benefit Forms:

In lieu of a normal pension, an employee may elect an optional annuity of equivalent actuarial value providing payments of 1/2, 2/3, or all of his reduced pension to his spouse after his death (Option A).

Alternatively, an employee may elect an optional annuity of equivalent actuarial value providing payments of 1/2, 2/3, or all of his reduced pension to his spouse after his death with the further provision that his benefit will be restored to the full amount to him after the death of his spouse (Option B).

Retired Employees:

Benefits for retired employees have been valued according to benefits in effect at time of retirement as modified by subsequent amendments. Such benefits are kept on records maintained by the Authority.

Voluntary Early Retirement Incentive Program:

During 1997, the Plan was amended to offer enhanced retirement benefits to all employees who have at least 25 years of continuous service on or before December 31, 1999, and who have not retired prior to January 1, 1997. Those eligible on or before June 30, 1997 must elect to participate during the period March 1, 1997, to June 30, 1997. Employees eligible during the period July 1, 1997, to December 31, 1999, must elect to participate between July 1, 1997, and February 28, 1998. All eligible employees who elect to participate must retire no later than December 31, 1999. The benefit is determined based on a formula multiplier of 2.40% of average annual compensation with the benefit cap at 70.0% of such average annual compensation.

Ad hoc increases in retiree benefits:

As part of the Arbitration Award ruling of November 13, 2003, the following ad hoc increases were given to retirees in payment status as of January 1, 2000:

(a) $75 per month for members retired before January 1,1980

(b) $50 per month for members who retired on or after January 1, 1980, but before January 1, 1991

(c) $40 per month for members who retired on or after January 1, 1991, but before January 1, 2000

As part of an Arbitration Award ruling of June 26, 2007, another ad hoc adjustment was made for participants.

Contribution Requirements Under P.A. 95-0708

Beginning January 18, 2008, the Authority shall make contributions to the Retirement Plan in an amount equal to 12 percent of compensation and participating employees shall make contributions in an amount equal to six percent of compensation. For years through 2040, the amount paid by the Authority with respect to debt service on bonds issued for contribution to the Retirement Plan shall be treated as a credit against the amount of required contribution, up to an amount not to exceed six percent of compensation paid by the Authority in the following year.

If the funded ratio is projected to decline below 60 percent in any year before 2040 using reasonable actuarial assumptions and the projected unit credit funding method, the contribution shall be increased so that the funded ratio is not projected to drop below 60 percent. If the funded ratio actually drops below 60 percent in any year before 2040, the contribution shall be increased so that the funded ratio is projected to reach 60 percent within 10 years. The increase in contributions shall be effective as of the January 1 following the determination, or 30 days following the determination, whichever is later. One-third of the increase in contributions shall be paid by participating employees and two-thirds by the Authority.

Contribution Requirements Under P.A. 95-0708, continued

Beginning in 2040, the minimum contribution for each fiscal year shall be predetermined each year as the amount required to bring the total assets of the Retirement Plan up to 90 percent of the total actuarial liabilities by the end of 2059, using the projected unit credit funding actuarial cost method and reasonable actuarial assumptions. Participating employees shall be responsible for one-third of the required contribution and the Authority shall be responsible for two-thirds of the required contribution.

Beginning in 2060, the minimum contribution for each year shall be an amount needed to maintain the total assets of the Retirement Plan at 90 percent of the total actuarial liabilities of the Plan and the contribution shall be funded one-third by participating employees and two-thirds by the Authority.

Section 6.2
Description of Actuarial Methods and Valuation Procedures

A. Actuarial Cost Method

Liabilities and contributions shown in this report are computed using the **Projected Unit Credit Cost Method** of funding.

Sometimes called a "funding method," this is a particular technique used by actuaries for establishing the amount and incidence of the annual actuarial cost of pension plan benefits, or normal cost, and the related unfunded actuarial accrued liability. Ordinarily the annual contribution to the plan is comprised of (1) the normal cost and (2) an amortization payment on the unfunded actuarial accrued liability.

Under the Projected Unit Credit Cost Method, the **Normal Cost** for the given year is computed as the present value of the unit of benefit attributable to that year for each active Member. The Normal Cost for the Plan is determined by summing individual results for each active Member.

The **Actuarial Accrued Liability** under this method at any point in time is equal to the present value of benefits accrued to the measurement date using a service pro-rate method.

The **Unfunded Actuarial Accrued Liability** is the excess of the Actuarial Accrued Liability over the Actuarial Value of Plan Assets actually on hand on the valuation date. The Unfunded Actuarial Accrued Liability is amortized as a level dollar amount over a fixed period of 30 years.

Under this method experience gains or losses, i.e. decreases or increases in accrued liabilities attributable to deviations in experience from the actuarial assumptions, adjust the Unfunded Actuarial Accrued Liability.

B. Asset Valuation Method

The actuarial value of assets is based on a five-year smoothing method and is determined by spreading the effect of each year's investment return in excess of or below the expected return. The Fair Value of assets at the valuation date is reduced by the sum of the following:

1. 80% of the return to be spread during the first year preceding the valuation date,
2. 60% of the return to be spread during the second year preceding the valuation date,
3. 40% of the return to be spread during the third year preceding the valuation date,
4. 20% of the return to be spread during the fourth year preceding the valuation date

C. Valuation Procedures

No actuarial liability is included for members who terminated non-vested prior to the valuation date, except those due a refund of contributions.

The compensation amounts used in the projection of benefits and liabilities were January 1, 2017 rates of pay provided by staff of the Retirement Board of Trustees.

No termination or retirement benefits were projected to be greater than the dollar limitation required by the Internal Revenue Code Section 415 for governmental plans.

Annual increases in salary were limited to the dollar amount defined under Internal Revenue Code Section 401(a)(17) for affected members.

Section 6.3
Summary of Actuarial Assumptions and Changes in Assumptions

Rate of Covered Pay: The rate of covered pay for participants has been estimated at $575,443,885 for 2017. The following adjustments were made to the actual covered earnings for 2016 supplied by the Authority:

(a) No earnings or a fractional year of earnings were submitted for employees with a work status date in 2016 who were hired during 2015. We have annualized the 2015 earnings and assumed minimum earnings of $50,750 per year for this group.

(b) For employees on layoff, extended leave of absence, or inactive status, we have assumed minimum earnings of $50,750 per year.

(c) For all employees, 2017 salary was assumed to increase 1.50% from 2016.

Retiree Benefits: The benefit amounts received for retirees were compared to information received from the Authority for the prior valuation.

Earnings on Plan Assets: 8.25% per annum, compounded annually.

Salary Inflation: 3.25%

Compensation Increases: According to the following table, compounded annually, assumed end of year (includes inflation):

Years of Service	Rate
1	9.00%
2	11.00%
3	16.00%
4	5.00%
>=5	4.00%

Mortality:

(a) *Active Members* — RP2000 Blue Collar Table, base year 2000 fully generational based on Scale BB.

(b) *Retirees & Survivors* — RP2000 Blue Collar Table, base year 2000 fully generational based on Scale BB.

(c) *Disabled Employees* — RP2000 Disabled Table, base year 2000 fully generational based on Scale BB.

Withdrawals from Service: According to the following table shown for illustrative ages:

Age	Rates of Termination for Reasons Other than Death or Disability
25	7.00%
30	5.10%
35	4.10%
40	2.90%
45	2.40%
50	1.90%
55 & Older	0.00%

If service is 25 or greater, no withdrawal is assumed.

Recovery from disability without returning to work: Disabled members are assumed to recover according to the following table as shown for illustrative ages:

Sample Attained Ages	Disabled Recovery [1]	
	Men	Women
30	0.412%	0.461%
35	0.406%	0.447%
40	0.382%	0.422%
45	0.326%	0.393%
50	0.216%	0.343%
55	0.013%	0.248%
60	0.000%	0.012%
65	0.000%	0.000%
70	0.000%	0.000%
75	0.000%	0.000%
80	0.000%	0.000%

1. Disability recovery after verification of the ability to return to work in the same position as determined by the Plan's Disability manager.

Disability Allowance: According to the following table as shown for illustrative ages:

Age	Rate of Disability
25	0.10%
30	0.10%
35	0.20%
40	0.30%
45	0.40%
50	0.50%
55	0.60%
60	0.70%
65 & older	0.78%

Service Retirements:

Age	Pre 1/19/2008 Hires Probability of Retirement		Post 1/18/2008 Hires Probability of Retirement	
	Service<25	Service>25	Service<25	Service>25
45-54	0.00%	20.00%	0.00%	0.00%
55	1.50%	20.00%	1.50%	1.50%
56	1.50%	22.50%	1.50%	1.50%
57	2.00%	25.00%	2.00%	2.00%
58	2.00%	27.50%	2.00%	2.00%
59	2.00%	30.00%	2.00%	2.00%
60	2.50%	32.50%	2.50%	2.50%
61	4.00%	35.00%	4.00%	4.00%
62	15.00%	37.50%	20.00%	20.00%
63	15.00%	40.00%	15.00%	15.00%
64	20.00%	42.50%	15.00%	15.00%
65	30.00%	45.00%	60.00%	60.00%
66	30.00%	45.00%	25.00%	25.00%
67	30.00%	45.00%	25.00%	25.00%
68	30.00%	45.00%	25.00%	25.00%
69	30.00%	45.00%	25.00%	25.00%
70-74	30.00%	45.00%	30.00%	30.00%
75	100.00%	100.00%	100.00%	100.00%

Spouse Data: 75% of employees eligible at retirement are assumed to be married, 50% of those married are assumed to elect a spouse option (Option A–50%) and the average equivalency factor to convert their accrued pension to a spouse option (Option A–50%) is assumed to be 85%. A wife is assumed to be 3 years younger than her husband. Actual dependent coverage data was used for participants retired as of the valuation date.

Miscellaneous and Technical Assumptions:

Pay Increase Timing:	End of (Fiscal) year.
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 service nearest whole year on the date the decrement is assumed to occur.
Benefit Service:	Exact fractional service from date of participation is used to determine the amount of benefit payable.
Decrement Relativity:	Decrement rates are used directly based on assumptions, without adjustment for multiple decrement table effects.
Decrement Operation:	Disability and turnover do not operate after 25 years of service.

Summary of changes since January 1, 2016 Valuation

The Asset Valuation Method was changed from Market Value of Assets to a 5 year smoothed Actuarial Value of Assets.

Glossary of Terms

Actuarial Accrued Liability	Total accumulated cost to fund pension benefits arising from service in all prior years.
Actuarial Cost Method	Technique used to assign or allocate, in a systematic and consistent manner, the expected cost of a pension plan for a group of plan members to the years of service that give rise to that cost.
Actuarial Present Value of Future Benefits	Amount which, together with future interest, is expected to be sufficient to pay all future benefits.
Actuarial Valuation	Study of probable amounts of future pension benefits and the necessary amount of contributions to fund those benefits.
Actuary	Person who performs mathematical calculations pertaining to pension and insurance benefits based on specific procedures and assumptions.
Annual Required Contribution	Disclosure measure of annual pension cost.
Normal Cost	That portion of the actuarial present value of benefits assigned to a particular year in respect to an individual participant or the plan as a whole.
Unfunded Actuarial Accrued Liability (UAAL)	The portion of the actuarial accrued liability not offset by plan assets.