Municipal Employees' Annuity And Benefit Fund of Chicago

Actuarial Valuation as of December 31, 2017

May 17, 2018

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Discussion Topics – Valuation and Projections

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- Summary of Valuation Results
- 50-Year Projection
- Membership, Assets, and GASB 67
- Appendix

Purposes of the Actuarial Valuation

- Report the Fund's actuarial assets
- Calculate the Fund's liabilities
- Determine the net pension liability and pension expense under Governmental Accounting Standards Board (GASB) Statements 67 and 68
- Calculate the Actuarially Determined Contribution (ADC) for the upcoming year and compare to the statutorily required contribution
- Provide information for annual financial statements

Changes Since Last Valuation

- On July 6, 2017, Public Act 100-0023 was signed into law and changed the Plan's funding and benefit provisions as follows:
  - In general, all members hired on or after July 6, 2017 are classified as Tier 3 members.
  - All current Tier 2 members were given a one-time option to switch to Tier 3 ("elective Tier 3").
  - Tier 3 benefit structure is the same as the Tier 2 benefit structure, except:
    - Unreduced retirement age lowered from age 67 to age 65.
    - Reduced retirement age lowered from age 62 to age 60.
    - Age eligible for first annual increase in employee annuity lowered from age 67 to age 65.
    - Member contribution rate increased from 8.5% of capped salary to 11.5% of capped salary, or normal cost rate if less.
    - Elective Tier 3 contribution rate is 10.5% of capped pay for 2018 and 11.5% thereafter, or normal cost rate if less.
  - For 2018 through 2022, employer contributions are specified amounts: $266 million in 2018, $344 million in 2019, $421 million in 2020, $499 million in 2021, and $576 million in 2022.
  - Starting in 2023, employer contributions are calculated as a level percent of payroll sufficient to bring the total assets of the Fund up to 90% of the actuarial accrued liability by the end of 2058.

Changes Since Last Valuation (continued)

- Based on the results of the experience study, the following assumptions were changed for this valuation:
  - Inflation assumption was lowered from 3.00% to 2.50%.
  - The Tier 2 and Tier 3 COLA rate and rate of increase of the pensionable salary cap was lowered from 1.50% to 1.25%.
  - Investment return assumption was lowered from 7.50% to 7.00%.
  - Salary increase rates were changed to five-year select and ultimate rates.
  - The mortality assumptions were updated to the most up-to-date tables (RP-2014) adjusted to match the Fund's experience, and projected generationally with Scale MP-2016 for future mortality improvement.
  - Termination rates were increased for all members.
  - Retirement rates for Tier 1 members were modified to better reflect anticipated future experience.
- The total impact of these changes was an increase in the actuarial accrued liability of $862 million, a decrease in the funded ratio of 1.5% and an increase in the actuarially determined contribution of 1.0%.

Summary of Valuation Highlights

- **Given the low funded ratio, the Fund is still at risk of potential insolvency if an economic recession or investment market downturn were to occur in the near term**
  - **The fixed-dollar contributions through 2022 leave the Fund vulnerable to adverse experience**
- Market value of assets returned 14.6% for year ended 12/31/2017
  - Gradual recognition of deferred gains resulted in 8.3% return on actuarial value of assets
- The funded ratio declined from last year due to contributions being less than the cost of benefits accrued during the year and interest on the unfunded liability, as well as assumption changes
  - Market value basis decreased from 29.5% (as of 12/31/2016) to 28.0% (as of 12/31/2017)
  - Actuarial value basis decreased from 30.5% to 27.4%
- Employer contributions booked for 2018 and to be received in 2019 are expected to be $344,000,000
- The actuarially determined contribution for 2018 is $1,049,915,647
  - Shortfall of approximately $706 million

Valuation Results ($ in millions)

	December 31, 2017 New Assumptions	December 31, 2017 Old Assumptions	December 31, 2016
Actuarial Accrued Liability:			
• Active Members	$5,872	$5,911	$5,896
• Inactive Members	505	469	434
• Retirees and Beneficiaries	9,905	9,040	8,725
Total	**$16,282**	**$15,420**	**$15,055**
Actuarial Assets	4,457	4,457	4,590
Unfunded Accrued Liability	$11,826	$10,964	$10,465
Funded Ratio	27.4%	28.9%	30.5%

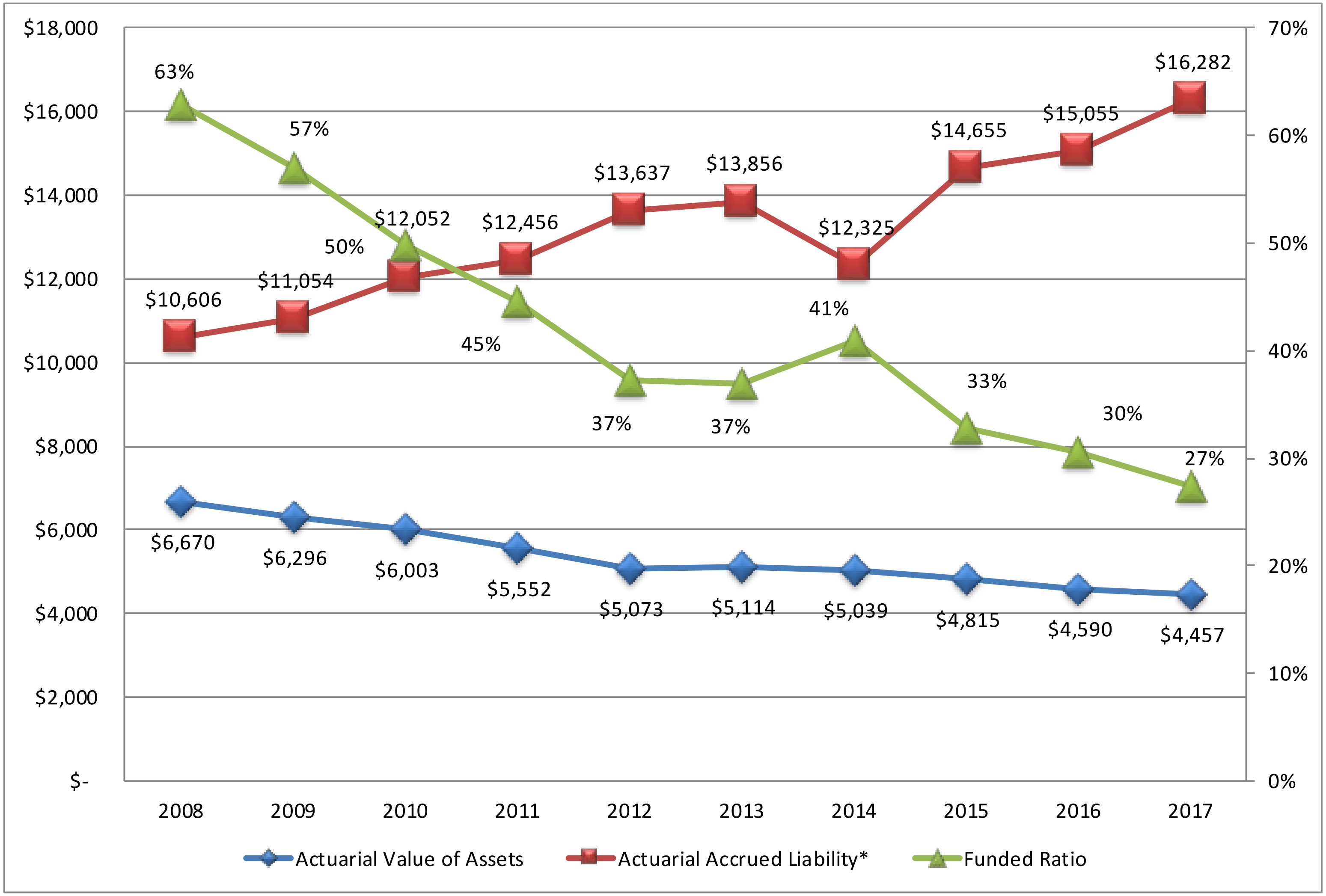
Numbers may not sum due to rounding

Reconciliation of Unfunded Liability

Reconciliation of Unfunded Actuarial Accrued Liability ($ Millions)		
Unfunded Liability as of 12/31/2016		$10,465
Effect of Contributions Less than Normal Cost and Interest on Unfunded Liability		649
Expected Unfunded Liability as of 12/31/2017		11,114
Changes Due to (Gain)/Loss from:		
• Investments	(33)	
• Demographics	(117)	
• Total		(150)
Changes in actuarial assumptions		862
Unfunded Liability as of 12/31/2017		$11,826

Actuarial Accrued Liability Vs. Actuarial Assets

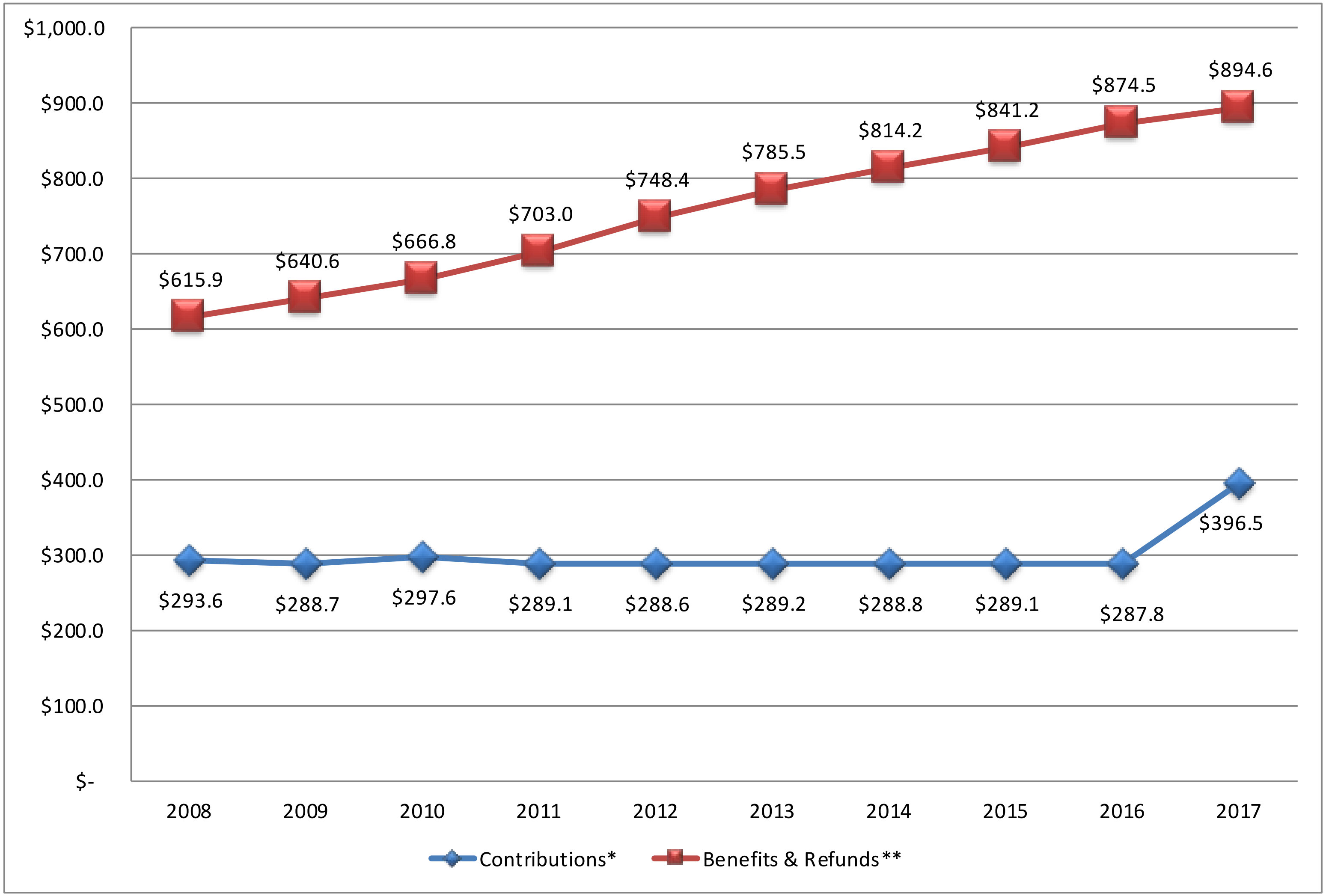
$ Millions



* Includes OPEB for years prior to 2016

Contributions vs. Benefits and Refunds

$ Millions



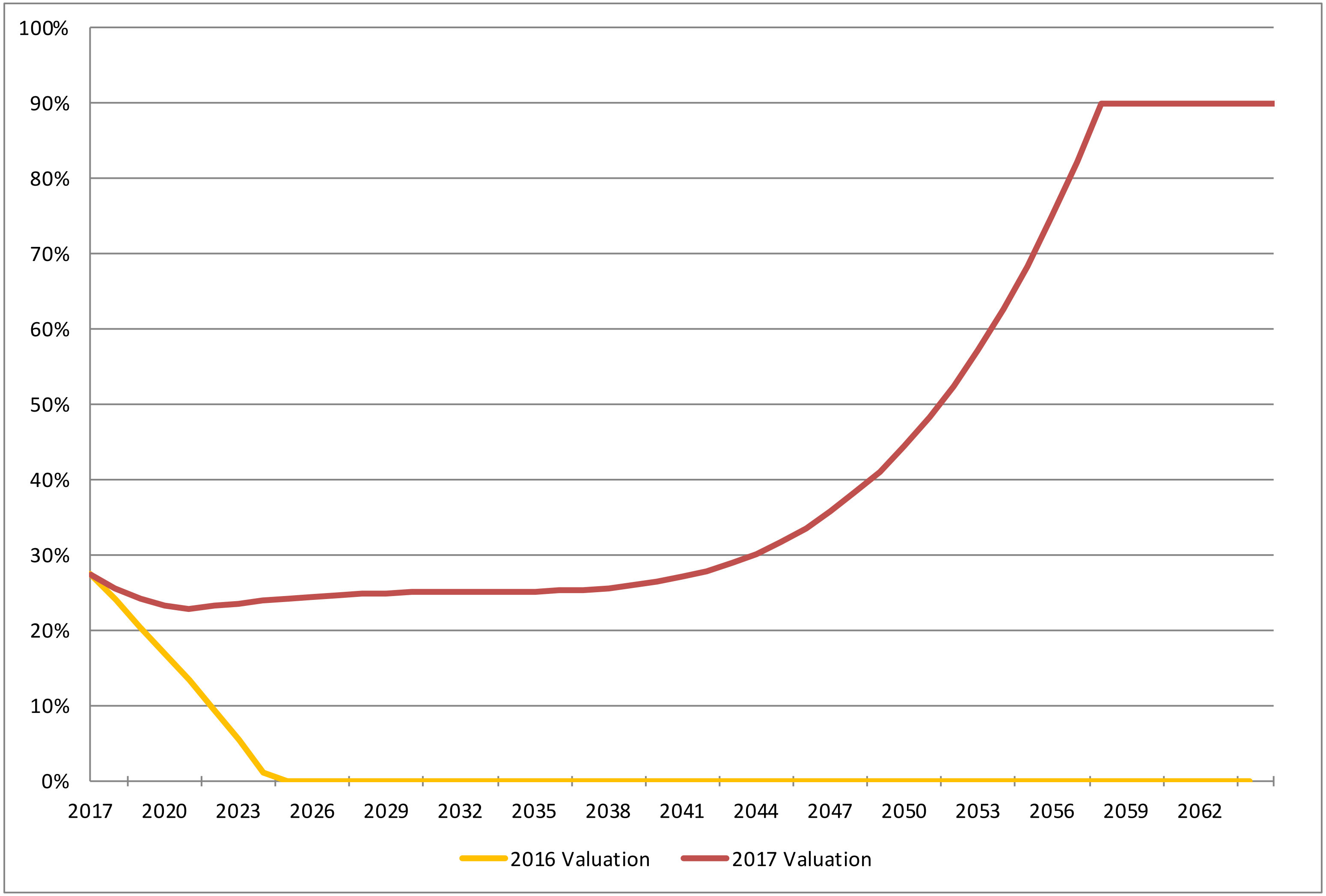
* Includes member and employer contributions

** Includes OPEB benefits for years prior to 2017 and administrative expenses

50-Year Projection

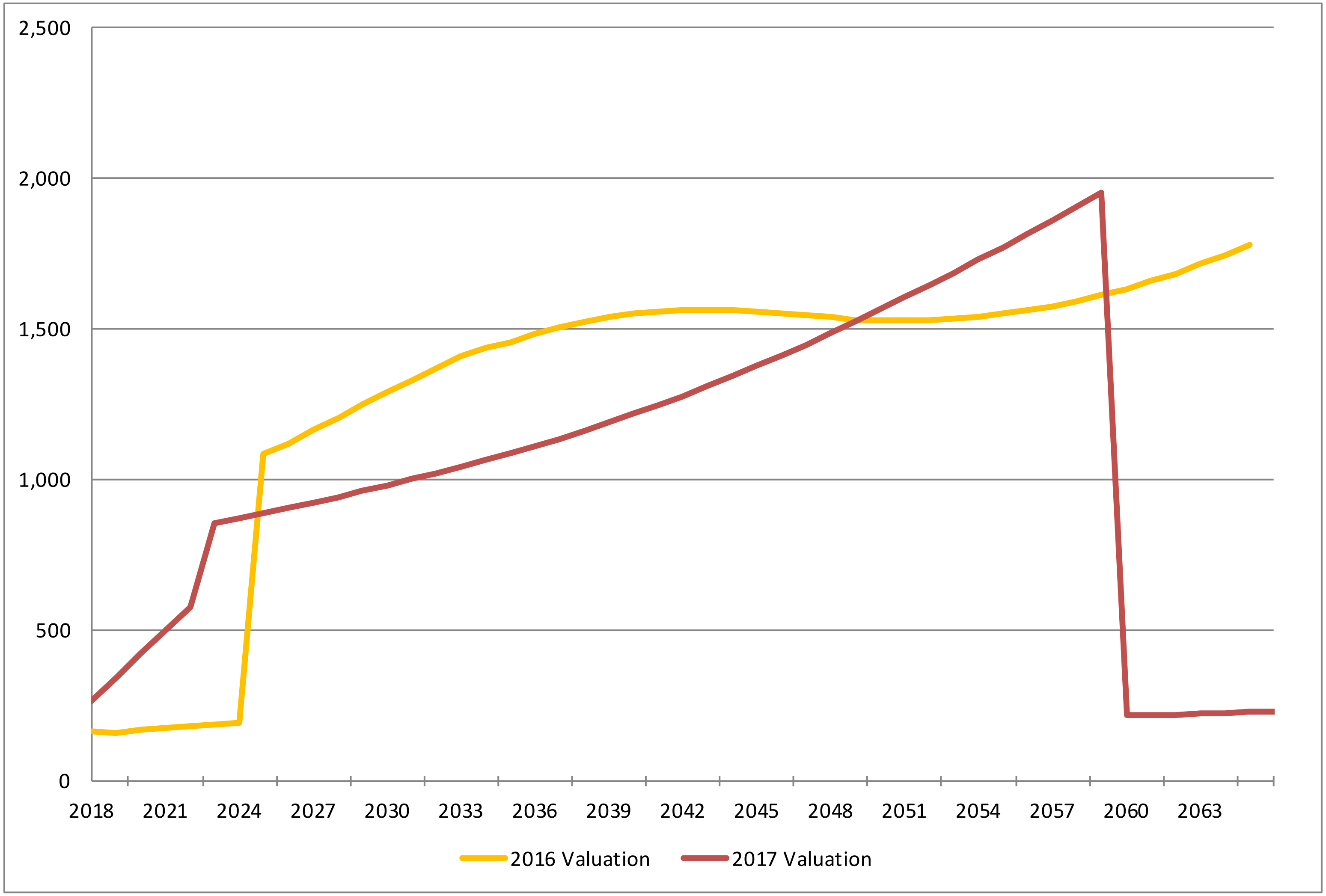
- Based on the results of the December 31, 2017 actuarial valuation
- Future member and employer contributions are made in accordance with Public Act 100-0023
- Assets are assumed to earn 7.0% per year
- The active population is assumed to remain level and future members are assumed to have similar characteristics to new members hired within the past 10 years

Projected Funded Ratio (AVA Basis)



Projected Employer Contributions

$ Millions



Note: 2016 Valuation contributions beyond 2024 represent “pay-as-you-go” funding

Membership

	2017	2016	Change
Active:			
• Number	30,922	30,296	+2.1%
• Pensionable Salary	$1,687 mil	$1,647 mil	+2.4%
• Average Age	46.4 years	46.6 years	-0.2 years
• Average Service	11.4 years	11.8 years	-0.4 years
Retirees and Beneficiaries			
• Number	25,383	25,236	+0.6%
• Total Annual Benefits	$871.6 mil	$839.2 mil	+3.9%
• Average Monthly Benefit	$2,862	$2,771	+3.3%

Assets

- The market value of assets increased from $4.436 billion (as of December 31, 2016) to $4.554 billion (as of December 31, 2017)
  - Investment return of 14.9%, net of investment expenses, reported by Investment Consultant
- The actuarial value of assets – which smoothes investment gains and losses over five years – decreased from $4.590 billion to $4.457 billion
  - Effective return of 8.3%, net of investment expenses
  - Actuarial value is 98% of market
  - There is a total of $97 million of deferred net investment gains that will be recognized in future years
- The average annual return on assets:

	Market	Actuarial
5-year	8.8%	8.7%
10-year	5.3%	4.4%

GASB 67 Net Pension Liability ($ in millions)

	December 31, 2017	December 31, 2016
Single Equivalent Discount Rate	7.00%	3.91%
Total Pension Liability	$16,282	$23,291
Plan Fiduciary Net Position	4,554	4,436
Net Pension Liability	11,728	18,855
Sensitivity of Net Pension Liability to changes in discount rate		
• 1% decrease (6.00% / 2.91%)	$13,808	$22,351
• Current discount rate (7.00% / 3.91%)	11,728	18,855
• 1% increase (8.00% / 4.91%)	10,006	15,984

Questions?

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Appendix

- Overview of valuation process
- Calculation of the actuarial value of assets
- Historical asset values and returns

How is an Actuarial Valuation Performed?

- Gather data as of the valuation date
  - Participant data
  - Financial data
- Project a benefit for each member, for each possible benefit
- Apply assumptions:
  - Economic (investment return, inflation, salary raises)
  - Demographic (death, disability, retirement, turnover)
- Apply assumptions to benefits to determine a total liability and assign liabilities to service
- Apply the funding policy to determine the Actuarially Determined Contribution
  - Based on actuarial cost method and asset valuation method

Actuarial Methods

Asset valuation method (actuarial value of assets)

- Smoothing of investment gains or losses
- MEABF uses a five-year smoothing method
  - Investment returns above or below the expected return are recognized over five years

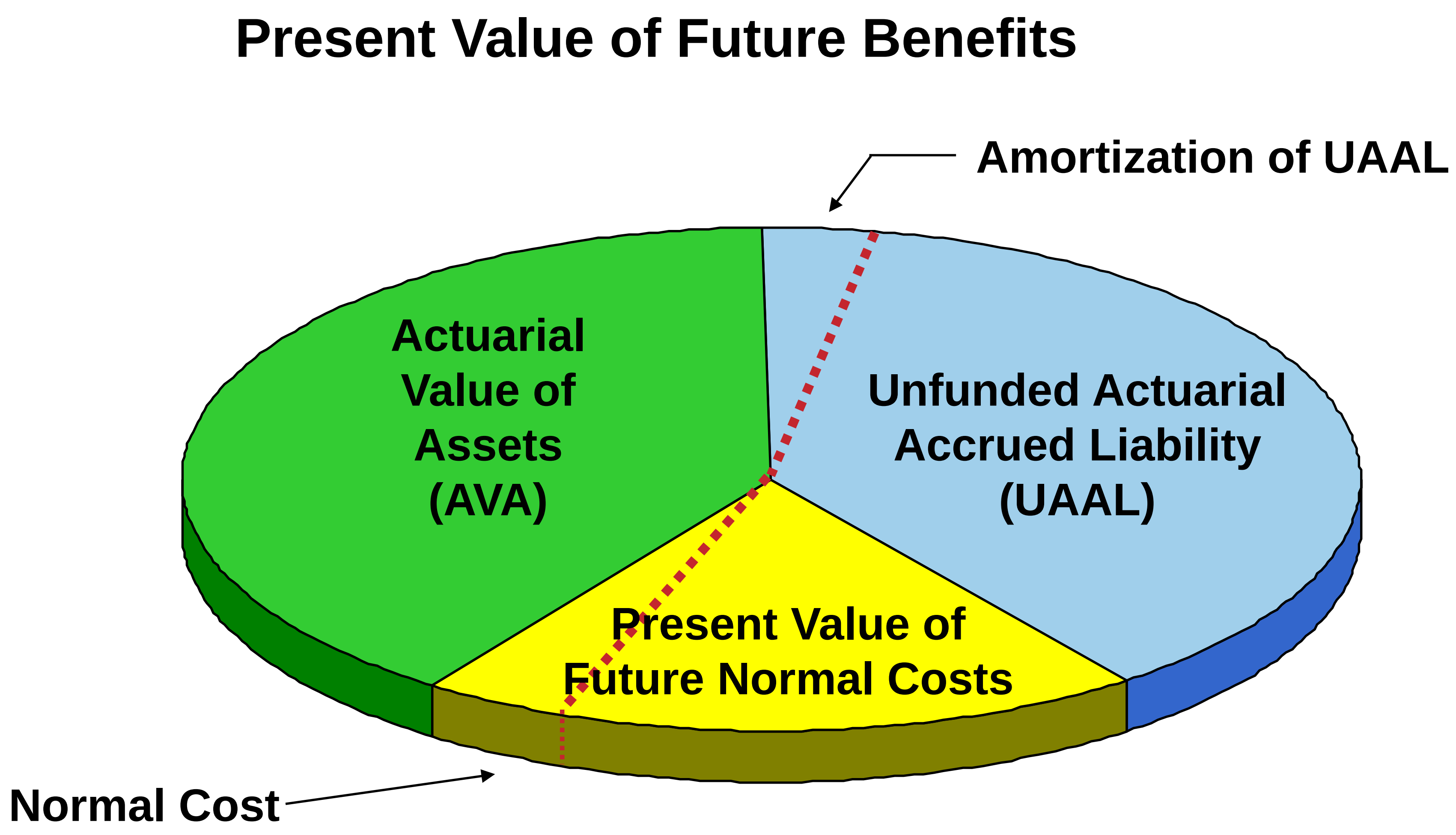
Cost method

- Allocation of liability between past service and future service
  - MEABF uses the entry age normal cost method
  - Same method used by most public sector retirement systems and is the cost method required by GASB for accounting purposes

Amortization method

- 30-year “open” period to pay off unfunded actuarial accrued liability
- Based on level dollar amortization

Actuarially Determined Contribution



Actuarial Value of Assets ($ in millions)

1. Market Value of Assets as of December 31, 2016	$4,436
2. Contributions and Benefits for FYE December 31, 2017	(493)
3. Expected Return	305
4. Expected Market Value of Assets (1) + (2) + (3)	$4,248
5. Actual Market Value of Assets on December 31, 2017	**4,554**
6. Excess/(Shortfall) for FYE December 31, 2017 (5) – (4)	306

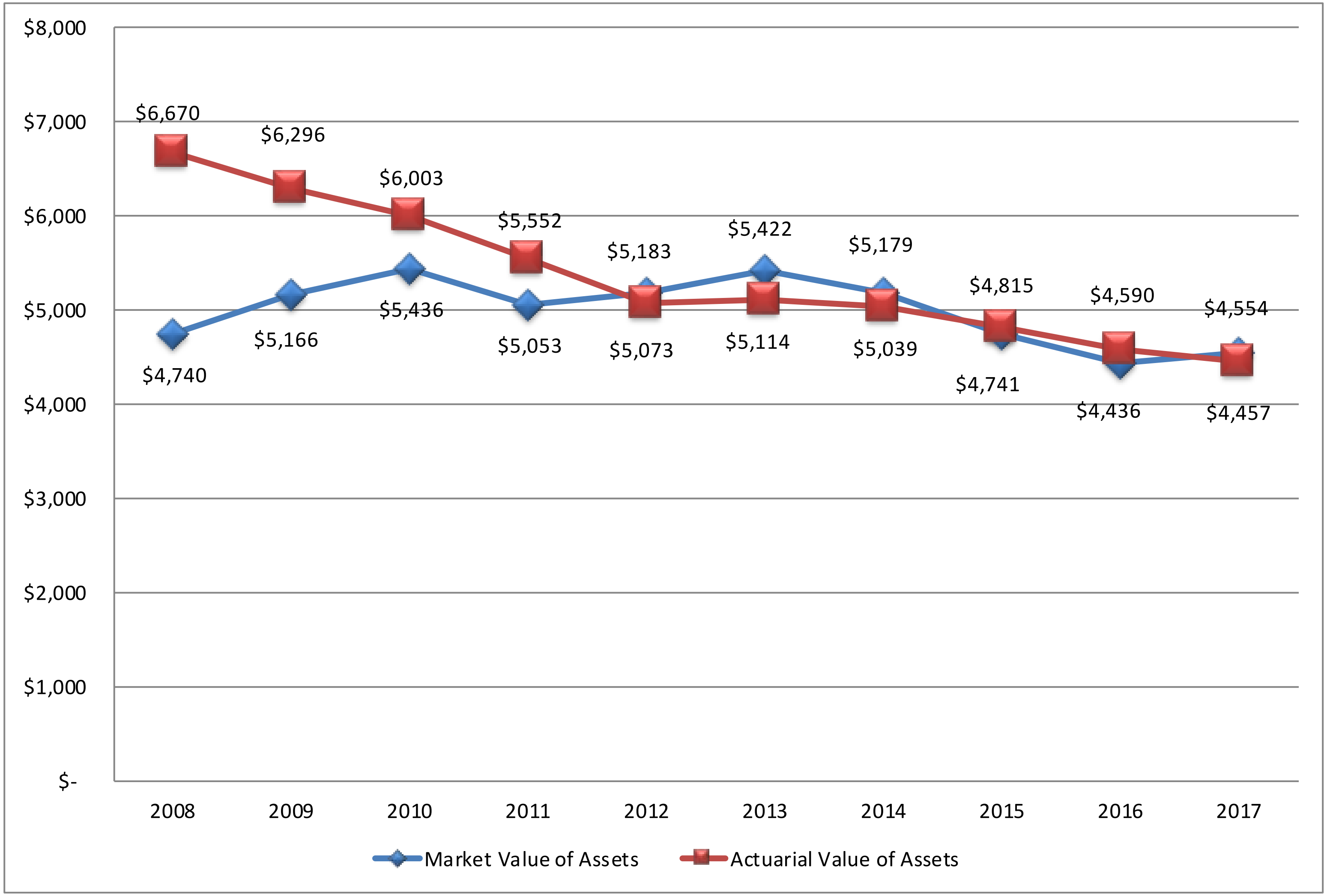
Excess/(Shortfall) Returns:

Year	Initial Amount	Deferral %	Unrecognized Amount
2017	$306	80%	$245
2016	-46	60%	-28
2015	-248	40%	-99
2014	-104	20%	-21
2013	365	0%	0
7. Total			**$97**

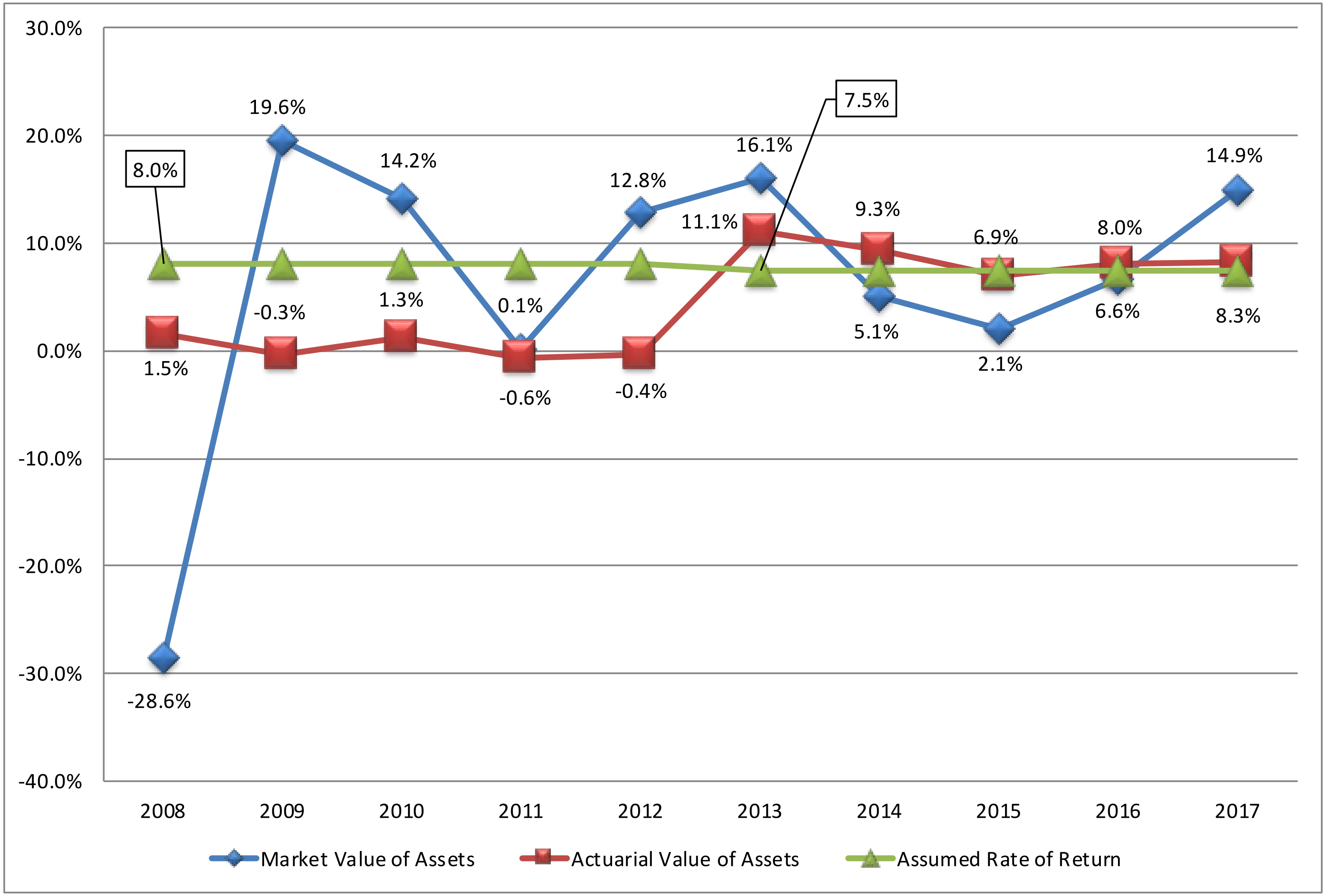
8. Actuarial Value of Assets as of December 31, 2017 (5) - (7)	**$4,457**
9. Actuarial Value of Assets as a % of Market Value of Assets	97.9%

Market and Actuarial Values of Assets

$ Millions



Asset Returns



Note: Investment return assumption lowered to 7.0% effective January 1, 2018