



# Pennsylvania Public School Employees' Retirement System

Five-Year Economic Experience Review

Prepared as of June 30, 2020

August 5, 2021

# Disclosures

The information contained herein is developed for the Board of Trustees and Staff of PSERS by Buck Global, LLC using generally accepted actuarial principles and techniques in accordance with all applicable Actuarial Standards of Practice (ASOPs). The purpose of this presentation is to provide key results of the June 30, 2020 five-year experience study. All recommendations contained in this report are consistent with each other, as appropriate.

Use of this presentation for any other purpose, or by anyone other than the Board of Trustees or the staff of PSERS, may not be appropriate and may result in mistaken conclusions because of failure to understand applicable assumptions, methods, or inapplicability of the presentation for that purpose. Buck should be asked to review any statement to be made on the basis of the results contained herein. Buck will accept no liability for any such statement made without prior review by Buck. No third party recipient of Buck's work product should rely upon Buck's work product absent involvement of Buck or without our approval.

The material contained herein is based on member and financial data, actuarial assumptions and methods, and System provisions applicable for the June 30, 2020 experience investigation of the Pennsylvania Public School Employees' Retirement System.

Where presented, references to "funded ratio" and "unfunded accrued liability" are measured on an actuarial value of assets basis. It should be noted that the same measurements using market value of assets would result in reduced funded ratios and increased unfunded accrued liabilities. Moreover, the funded ratios presented are appropriate for evaluating the need for and level of future contributions but provide no indication of the funded status of the System if the System were to settle (i.e., purchase annuities to cover) a portion or all of its liabilities.

See page 45 for a discussion of models used in calculating the results shown in this presentation.

Future actuarial measurements may differ significantly from current measurements due to System experience differing 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 System provisions or applicable law. An analysis of the potential range of future results is beyond the scope of this study.

David L. Driscoll is a Fellow of the Society of Actuaries and a Member of the American Academy of Actuaries. Edward Quinn and Salvador Nakar are Members of the American Academy of Actuaries. We meet the Qualification Standards of the American Academy of Actuaries to render the actuarial opinions contained herein. We are available to answer any questions on the material contained herein, or to provide explanations or further details as may be appropriate.

# Experience Review

Section 8502(j) of the Retirement Code provides that in every five-year period, the actuary of the System is to make an actuarial investigation and evaluation of the mortality, service and compensation experience of the members and beneficiaries covered under the System during the preceding five years.

- This report presents the results of the System's economic experience review for the five-year period July 1, 2015 through June 30, 2020
  - Investment Return
  - Inflation
  - Individual Salary Increases
  - Payroll Growth
  - Administrative Option Factors
- Buck presented and the Board approved the results of the demographic experience review for the five-year period July 1, 2015 through June 30, 2020:
  - March 4, 2021 Budget/Finance Committee meeting
    - Withdrawal
    - Retirement
    - Disability
    - Withdrawal Annuity Benefit Commencement
    - Optional Forms of Payment Elections
  - June 10, 2021 Budget/Finance Committee meeting
    - Mortality
- Cost analysis related to the economic experience review is based on the Board-approved results of the demographic experience review

# Cost Impact of Demographic Assumption Changes

Item	June 30, 2020 Actuarial Valuation				
	Unfunded Accrued Liability <sup>1</sup>	Funded Ratio <sup>1</sup>	Normal Cost Rate	Employer Pension Rate <sup>2</sup>	Employer Pension Contribution <sup>2,3</sup>
<b>BEFORE CHANGES</b>	<b>\$44,034 Mil</b>	<b>59.2%</b>	<b>7.20%</b>	<b>33.99%</b>	<b>\$4,857 Mil</b>
<b>Demographic Assumptions<sup>4</sup></b>					
<b>1. Non-mortality assumptions (approved by the Board March 4)</b>	(926)	0.5	(0.92)	(1.37)	(196)
<b>2. Mortality assumptions (approved by the Board June 10)</b>	1,283	(0.7)	0.11	0.74	106
<b>TOTAL DEMOGRAPHIC CHANGES</b>	<b>\$ 357 Mil</b>	<b>(0.2)%</b>	<b>(0.81)%</b>	<b>(0.63)%</b>	<b>\$ (90) Mil</b>
<b>AFTER REFLECTING CHANGES</b>	<b>\$45,391 Mil</b>	<b>59.0%</b>	<b>6.39%</b>	<b>33.36%</b>	<b>\$ 4,767 Mil</b>

1. Actuarial value of assets basis.

2. Without regard to the Act 5 DC contribution and Premium Assistance.

3. Based on the fiscal year 2022 appropriation pay of \$14,289,000,000.

4. The cost effect of each proposed assumption is subject to change depending on the sequence of recognized assumptions.

In addition, the changes in demographic assumptions would decrease the Premium Assistance contribution rate for fiscal year 2021/2022 from 0.80% to 0.78%.

# Option Factor Presentation

Please refer to Buck's August 5, 2021  
Update of Administrative Option Factors Presentation

# Cost Impact of Demographic Assumption Changes

Item	June 30, 2020 Actuarial Valuation				
	Unfunded Accrued Liability <sup>1</sup>	Funded Ratio <sup>1</sup>	Normal Cost Rate	Employer Pension Rate <sup>2</sup>	Employer Pension Contribution <sup>2,3</sup>
<b>BEFORE CHANGES</b>	<b>\$44,034 Mil</b>	<b>59.2%</b>	<b>7.20%</b>	<b>33.99%</b>	<b>\$4,857 Mil</b>
<b>Demographic Assumptions<sup>4</sup></b>					
1. <b>Non-mortality assumptions</b> (approved by the Board March 4)	(926)	0.5	(0.92)	(1.37)	(196)
2. <b>Mortality assumptions</b> (approved by the Board June 10)	1,283	(0.7)	0.11	0.74	106
3. <b>Administrative Option Factors</b>	771	(0.4)	0.21	0.59	84
<b>TOTAL DEMOGRAPHIC CHANGES</b>	<b>\$ 1,128 Mil</b>	<b>(0.6)%</b>	<b>(0.60)%</b>	<b>(0.04)%</b>	<b>\$ (6) Mil</b>
<b>AFTER REFLECTING CHANGES</b>	<b>\$45,162 Mil</b>	<b>58.6%</b>	<b>6.60%</b>	<b>33.95%</b>	<b>\$ 4,851 Mil</b>

1. Actuarial value of assets basis.

2. Without regard to the Act 5 DC contribution and Premium Assistance.

3. Based on the fiscal year 2022 appropriation pay of \$14,289,000,000.

4. The cost effect of each proposed assumption is subject to change depending on the sequence of recognized assumptions.

In addition, the changes in demographic assumptions would decrease the Premium Assistance contribution rate for fiscal year 2021/2022 from 0.80% to 0.78%.

# Expected Long Term Rate of Return

Please refer to the Aon, Verus and Buck August 5, 2021  
Capital Market Assumptions Presentations for their 30 Year Expected  
Return Forecasts

# Things That Happen to Money

- **KNOWN at valuation date:**

1. Market value of System assets
2. Composition of System of assets
  - Stocks
  - Bonds
  - Short term
  - Long term
  - International
  - Real estate
  - Alternative investments
  - Cash

- **ASSUMED at valuation date:**

1. Future rates of investment return
2. Future rates of inflation



# Things That Happen to Members\* – Salary Increases

- KNOWN at valuation date:

<u>Salary History</u>	
Age 45	\$ 63,820
Age 46	66,788
Age 47	69,760
Total	\$200,368
<u>Current 3-Year FAS</u>	
$\$200,368/3 = \$66,789$	

- ASSUMED at valuation date:

<u>at Retirement</u>	
Age 57	\$ 99,497
Age 58	102,731
Age 59	106,070
Total	\$308,298
<u>Projected 3-Year FAS</u>	
$\$308,298/3 = \$102,766$	

\* 3-year FAS for Classes TC, TD, TE and TF. Classes TG and TH have a 5-Year FAS.

# Actuarial Assumptions - Economic

## Current Assumptions

- Rate of Return - 7.25%
  - Components:
    - Inflation – 2.75%
    - Real Rate of Return - 4.50%
- Annual Salary Increase - 5.00% (Effective Average)
  - Components:
    - Inflation – 2.75%
    - Real Wage Growth & Career Scale - 2.25%
- PSERS Assumptions Shown in Table 12 of Valuation Report

# Setting Economic Assumptions

- Actuary advises Board on adequacy of assumptions
  - Review past experience
  - Review general practice
  - Develop component parts of each assumption
    - Maintain linkage with investments
    - Maintain internal consistency
  - Make judgment about future
- Board sets assumptions based on information provided

# Historical Rate of Investment Return Assumption

June 30 Valuation	Rate of Investment Return Assumption
Before 2008	8.50%
2008	8.25%
2009 - 2010	8.00%
2011 - 2015	7.50%
2016 – 2020	7.25%

# Market Value of Assets Return History - 2000 to 2020

Fiscal Year Ending June 30	Market Value Return	Fiscal Year Ending June 30	Market Value Return
2001	-7.4%	2011	20.4%
2002	-5.3%	2012	3.4%
2003	2.7%	2013	8.0%
2004	19.7%	2014	14.8%
2005	12.9%	2015	3.1%
2006	15.3%	2016	1.3%
2007	22.9%	2017	10.2%
2008	-2.8%	2018	9.3%
2009	-26.5%	2019	6.7%
2010	14.6%	2020	1.1%

## Average annual return

10-Year ending June 30, 2020: 7.67%

20-Year ending June 30, 2020: 5.57%

25-Year ending June 30, 2020: 7.46%

Note: Market value returns are provided by PSERS investment consultant.

# Capital Market Assumptions

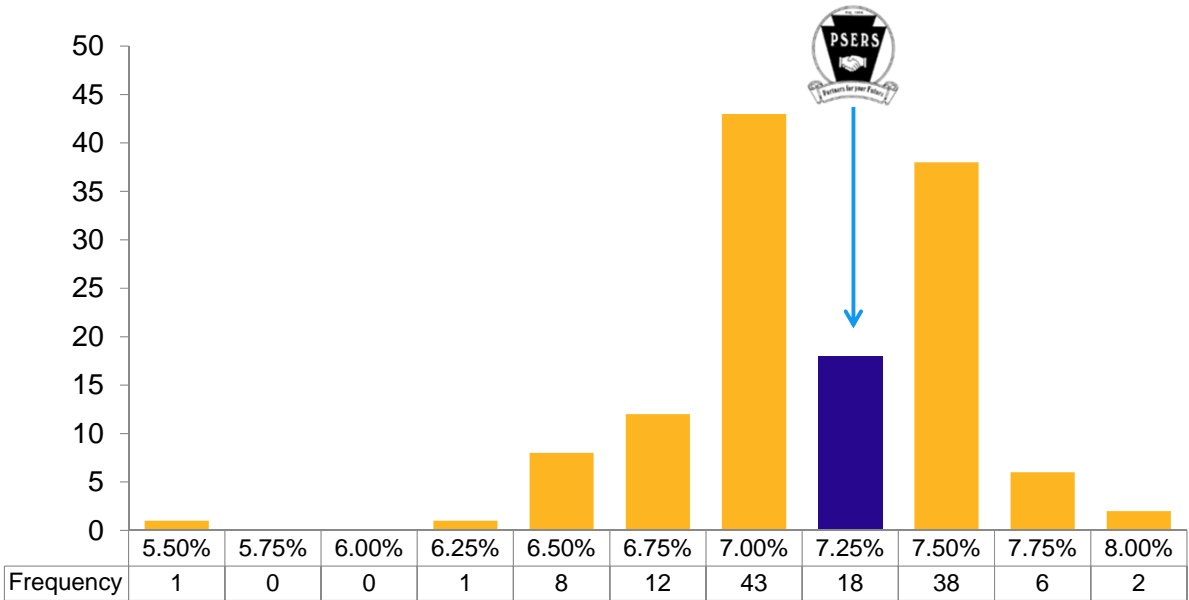
- EROAs presented to the Board
  - Aon, Verus and Buck presented 30-year expected geometric EROAs and the following is a comparison to a hypothetical global 60%/40% portfolio:

	<b>Aon</b>	<b>Verus</b>	<b>Buck</b>	<b>60% / 40% Portfolio</b>
<b>EROA</b>	6.99%	6.40%	6.79%	5.75%
<b>Standard Deviation</b>	11.92%	12.60%	9.89%	11.28%
<b>Sharpe Ratio</b>	0.402	0.500	0.489	0.315

# Distribution of Systems and Rate of Investment Return Assumption Used for Valuation

	Statistics
Number of Plans	129
Minimum	5.25%
Maximum	8.00%
Mean	7.13%
Median	7.00%

Source: National Association of State Retirement Administrators  
Rates shown as of June 2021



# Rate of Investment Return Assumption

Actual Past Experience		
Fiscal Year	Increase In CPI-U	Return on Market Value of Assets*
2015/2016	1.0%	1.33%
2016/2017	1.8	10.20
2017/2018	2.9	9.26
2018/2019	1.6	6.66
2019/2020	0.1	1.11
<u>Geometric Average</u>		
5-Year	1.50%	5.64%
10-Year	--	7.67%
15-Year	--	6.08%
20-Year	--	5.57%
25-Year	--	7.46%
<b>Current Assumption</b>	<b>2.75%</b>	<b>7.25%</b>
<b>Conclusion</b>	<b>High</b>	<b>Reconsider</b>
<b>Consider</b>	<b>2.50%</b>	<b>7.125%</b>
	<b>2.25%</b>	<b>7.00%</b>
		<b>6.875%</b>
		<b>6.75%</b>

\* Provided by PSERS' investment consultant



# Salary Increase Rate

Average Age	Actual Percentage Increase					Total	Assumption		
	2015/2016	2016/2017	2017/2018	2018/2019	2019/2020		Current	Proposal 1*	Proposal 2*
20	23.4%	22.9%	14.4%	15.1%	11.6%	18.1%	10.1%	9.8%	9.5%
25	9.9%	8.5%	7.4%	8.2%	5.9%	8.1%	9.2%	8.9%	8.6%
30	5.7%	5.2%	5.2%	5.6%	5.1%	5.3%	7.8%	7.5%	7.2%
35	4.8%	4.3%	4.6%	4.8%	4.7%	4.6%	6.8%	6.5%	6.2%
40	4.3%	4.2%	4.1%	4.3%	4.1%	4.2%	5.8%	5.5%	5.2%
45	3.5%	3.3%	3.1%	3.3%	2.9%	3.2%	4.8%	4.5%	4.2%
50	3.0%	3.0%	2.8%	2.9%	2.5%	2.8%	3.8%	3.5%	3.2%
55	2.7%	2.8%	2.9%	2.9%	2.6%	2.7%	3.3%	3.0%	2.8%
60	2.6%	2.8%	2.9%	2.9%	2.7%	2.7%	3.3%	3.0%	2.8%
65	2.4%	2.7%	2.9%	2.6%	2.4%	2.5%	3.3%	3.0%	2.8%
70+	2.8%	2.8%	2.5%	3.1%	2.3%	2.6%	3.2%	3.0%	2.8%
<b>Total</b>	<b>3.9%</b>	<b>3.8%</b>	<b>3.8%</b>	<b>3.9%</b>	<b>3.5%</b>	<b>3.7%</b>	<b>5.0%</b>	<b>4.75%</b>	<b>4.5%</b>

\* Proposal 1: Averages to 0.25% less than Current.

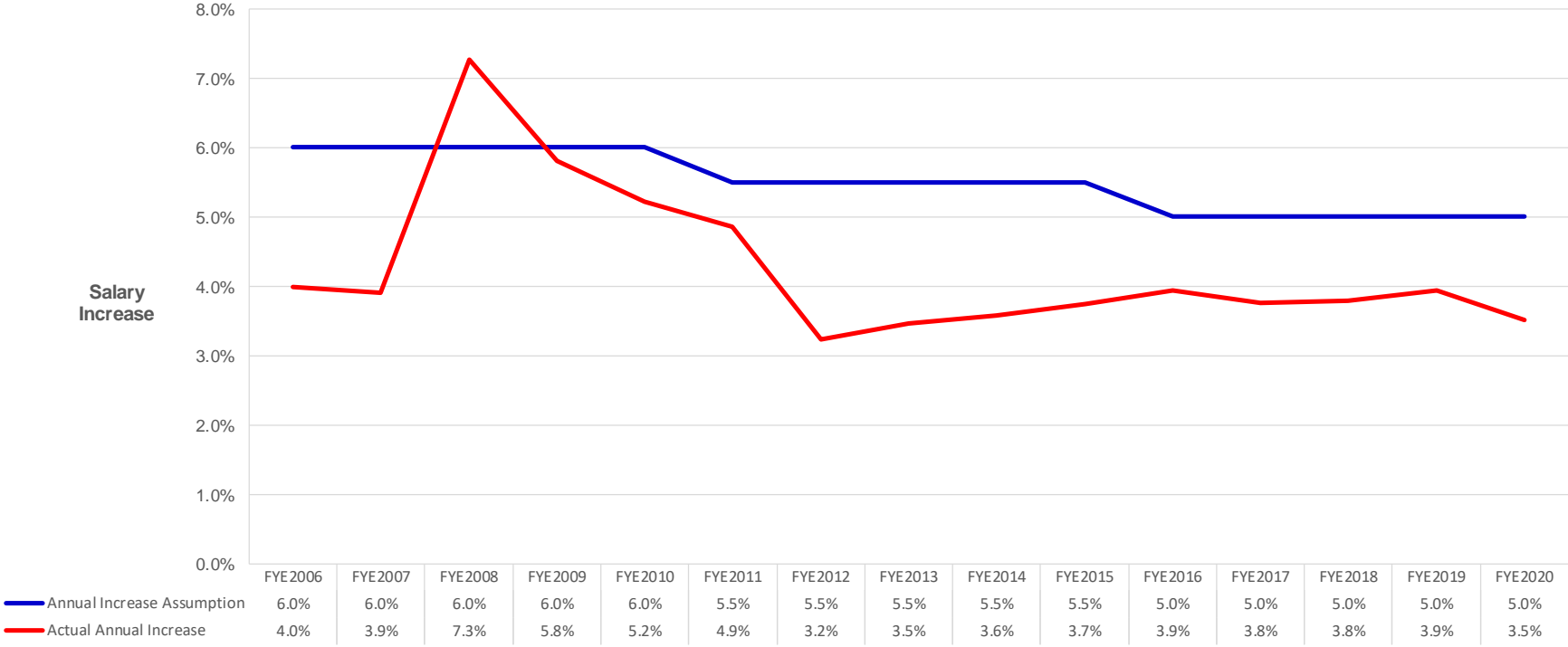
Proposal 2: Averages to 0.50% less than Current.

# Salary Increase Rate

Average Age	Historical Average Actual Salary Experience		
	Five Year Average (2015 – 2020)	Ten Year Average (2010 – 2020)	Fifteen Year Average (2005 – 2020)
20	18.1%	16.5%	17.0%
25	8.1%	8.1%	8.7%
30	5.3%	5.2%	6.0%
35	4.6%	4.6%	5.2%
40	4.2%	4.2%	4.7%
45	3.2%	3.3%	3.9%
50	2.8%	2.9%	3.4%
55	2.7%	2.7%	3.1%
60	2.7%	2.6%	3.0%
65	2.5%	2.4%	2.7%
70+	2.6%	2.4%	3.0%
Total	3.7%	3.8%	4.3%

# Salary Increase Rate

Annual Salary Increase: Assumed vs. Actual  
Fiscal Year Ending 2006 to Fiscal Year Ending 2020



# Salary Increase Rate

Actual Past Experience	
Fiscal Year	Individual Salary Increases
2015/2016	3.9%
2016/2017	3.8
2017/2018	3.8
2018/2019	3.9
2019/2020	3.5
<u>Geometric Average</u>	
5-Year	3.7%
10-Year	3.8%
15-Year	4.3%
<b>Current Assumption</b>	<b>5.00%</b>
<b>Conclusion</b>	<b>High</b>
<b>Consider</b>	<b>4.75%</b>
	<b>4.50%</b>

# Economic Assumption Components

- Rate of Investment Return

	Current	Proposal 1	Proposal 2	Proposal 3	Proposal 4
Inflation	2.750%	2.500%	2.500%	2.250%	2.250%
Real Return	<u>4.500</u>	<u>4.625</u>	<u>4.500</u>	<u>4.625</u>	<u>4.500</u>
	7.25%	7.125%	7.00%	6.875%	6.75%

- Salary Increase Rate

	Current	Proposal 1	Proposal 2
Inflation	2.75%	2.50%	2.25%
Real Wage/Growth Career Scale	<u>2.25</u>	<u>2.25</u>	<u>2.25</u>
	5.00%	4.75%	4.50%

- The combined assumption of Rate of Investment Return and Salary Increase Rate should be based on a common inflation component

# Change in Unfunded Accrued Liability<sup>1</sup> due to Economic Assumption Changes Only<sup>2</sup>

Average Annual Salary Increase Assumption	June 30, 2020 Actuarial Valuation Interest Rate Assumption				
	7.25% (current)	7.125%	7.00%	6.875%	6.75%
5.00% (current)	-	\$1,439 Mil	\$2,896 Mil	\$4,383 Mil	\$5,902 Mil
4.75%	\$(580) Mil	\$850	\$2,298	\$3,776	\$5,285
4.50%	\$(1,200)	\$221	\$1,658	\$3,126	\$4,624

1. Actuarial value of assets basis.

2. The amounts are in addition to the \$45,162 Mil Board-approved results of the demographic experience review and administrative option factors update found on page 6.

# Change in Funded Ratios<sup>1</sup> under the Various Economic Assumptions Only<sup>2</sup>

Average Annual Salary Increase Assumption	June 30, 2020 Actuarial Valuation Interest Rate Assumption				
	7.25% (current)	7.125%	7.00%	6.875%	6.75%
5.00% (current)	-	(0.8)%	(1.5)%	(2.3)%	(3.0)%
4.75%	0.3%	(0.5)%	(1.2)%	(2.0)%	(2.7)%
4.50%	0.7%	(0.1)%	(0.9)%	(1.6)%	(2.4)%

1. Actuarial value of assets basis.

2. The amounts are in addition to the 58.6% Board-approved results of the demographic experience review and administrative option factors update found on page 6.

# Change in Employer Pension Contribution Rates due to Economic Assumption Changes Only<sup>1</sup>

Average Annual Salary Increase Assumption	June 30, 2020 Actuarial Valuation Interest Rate Assumption				
	7.25% (current)	7.125%	7.00%	6.875%	6.75%
<b><u>5.00% (current)</u></b>					
Normal Cost Rate		.39%	.79%	1.19%	1.62%
Unfunded Liability Rate		<u>.45%</u>	<u>.89%</u>	<u>1.33%</u>	<u>1.76%</u>
Employer Pension Rate		0.84%	1.68%	2.52%	3.38%
<b><u>4.75%</u></b>					
Normal Cost Rate	(.49)%	(.15)%	.23%	.62%	1.03%
Unfunded Liability Rate	<u>(.29)%</u>	<u>.16%</u>	<u>.60%</u>	<u>1.04%</u>	<u>1.47%</u>
Employer Pension Rate	(.78)%	.01%	.83%	1.66%	2.50%
<b><u>4.50%</u></b>					
Normal Cost Rate	(1.04)%	(.72)%	(.36)%	.01%	.40%
Unfunded Liability Rate	<u>(.59)%</u>	<u>(.14)%</u>	<u>.30%</u>	<u>.73%</u>	<u>1.17%</u>
Employer Pension Rate	(1.63)%	(.86)%	(.06)%	.74%	1.57%

1. The amounts are in addition to the 6.60% Normal Cost Rate and 27.35% Unfunded Liability Rate Board-approved results of the demographic experience review and administrative option factors update found on page 6.

Without regard to the Act 5 DC contribution and Premium Assistance.



# Change in Employer Pension Contribution Amount due to Economic Assumption Changes Only<sup>1</sup>

Average Annual Salary Increase Assumption	June 30, 2020 Actuarial Valuation Interest Rate Assumption				
	7.25% (current)	7.125%	7.00%	6.875%	6.75%
5.00% (current)	-	\$120 Mil	\$240 Mil	\$360 Mil	\$483 Mil
4.75%	\$(111) Mil	\$1	\$119	\$237	\$357
4.50%	\$(233)	\$(123)	\$(9)	\$106	\$224

1. The amounts based on the fiscal year 2022 appropriation pay of \$14,289,000,000 and are in addition to the \$4,851 Mil Board-approved results of the demographic experience review and administrative option factors update found on page 6.  
Without regard to the Act 5 DC contribution and Premium Assistance.

# Payroll Growth

- The amortization of the System's unfunded accrued liability uses a level percentage of payroll method which produces a payment stream that is designed to increase based on the expected growth in payroll
  - The current assumption is 3.5% per annum
  - If the actual payroll used to determine employer contributions:
    - Is less than the anticipated amount based on a 3.5% payroll growth, results in under-contribution
    - Is greater than the anticipated amount based on a 3.5% payroll growth, results in over-contribution

# Payroll Growth

- Actual experience
  - Over the study period

FYE	2015	2016	2017	2018	2019	2020
Active #	259,868	257,080	255,945	256,362	255,749	256,246
Total PSERS Payroll	\$12,866,473	\$12,954,778	\$13,313,900	\$13,466,526	\$13,791,197	\$14,036,006
Increase in Total Payroll		0.7%	2.8%	1.1%	2.4%	1.8%

- Five-year experience fiscal year ending 2001 – fiscal year ending 2020 (from PSERS staff)

	2001-2005	2006-2010	2011-2015	2016-2020
Increase in Total Payroll	4.71%	3.39%	-0.15%	1.82%

- Payroll growth was impacted by the Great Recession
  - The most recent 5-year period bounced back after the impact of the Great Recession
- Based on salary surveys from employers, PSERS staff is anticipating a 3.5% growth in payroll for fiscal year ending 2022 and an estimated 2.5% thereafter. Recent increase in charter school payrolls.
- The uncertainty of the pandemic effect
  - Triggered a lot of people to leave teaching
  - Created labor shortages in areas like teachers of specialty subjects, food service and transportation

# Payroll Growth

- The payroll growth assumption is related to the assumed Rate of Investment Return through the common element of the inflation component

<b>Annual Rate of Investment Return</b>	<b>Payroll Growth</b>
7.25%	3.5%
7.125%	3.5%
7.00%	3.25%
6.875%	3.25%
6.75%	3.0%

# Comparison of Projected System Funded Ratio

(Based on Actuarial Value of Assets)

Fiscal Year Ending (FYE)	Current June 30, 2020 Valuation Assumptions	Revised Demographic, 5.0% Average Salary Increase and Interest Rate Assumption/Payroll Growth (Effective FYE 2021)				
		7.25%/3.5%	7.125%/3.5%	7.00%/3.25%	6.875%/3.25%	6.75%/3.0%
2020	59.2%	59.2%	59.2%	59.2%	59.2%	59.2%
2021	60.3%	59.5%	58.8%	58.0%	57.3%	56.5%
2022	61.8%	61.0%	60.1%	59.3%	58.5%	57.6%
2023	63.4%	62.6%	61.8%	61.0%	60.2%	59.4%
2024	64.9%	64.1%	63.3%	62.6%	61.8%	61.1%
2025	66.7%	66.0%	65.2%	64.5%	63.7%	63.1%

Note: Assumes a Fiscal Year ending 6/30/2021 Investment Return of 20.00% and the assumed investment return thereafter.

# Comparison of Projected System Unfunded Accrued Liability

(Based on Actuarial Value of Assets)

Fiscal Year Ending (FYE) (\$ millions)	Current June 30, 2020 Valuation Assumptions	Revised Demographic, 5.0% Average Salary Increase and Interest Rate Assumption/Payroll Growth (Effective FYE 2021)				
		7.25%/3.5%	7.125%/3.5%	7.00%/3.25%	6.875%/3.25%	6.75%/3.0%
2020	\$44,034.5	\$44,034.5	\$44,034.5	\$44,034.5	\$44,034.5	\$44,034.5
2021	43,836.6	45,180.3	46,645.6	48,125.3	49,636.0	51,178.6
2022	43,119.1	44,576.9	46,144.8	47,724.5	49,333.6	50,972.9
2023	42,161.2	43,634.0	45,192.0	46,693.7	48,288.0	49,839.4
2024	41,265.6	42,750.4	44,297.0	45,722.8	47,300.7	48,766.6
2025	39,881.5	41,347.9	42,881.1	44,233.9	45,793.4	47,176.9

Note: Assumes a Fiscal Year ending 6/30/2021 Investment Return of 20.00% and the assumed investment return thereafter.

# Comparison of Projected System Appropriation Payroll

Fiscal Year Ending (FYE) (\$ millions)	Current June 30, 2020 Valuation Assumptions	Revised Demographic, 5.0% Average Salary Increase and Interest Rate Assumption/Payroll Growth (Effective FYE 2023)				
		7.25%/3.5%	7.125%/3.5%	7.00%/3.25%	6.875%/3.25%	6.75%/3.0%
2022	\$14,289.0	\$14,289.0	\$14,289.0	\$14,289.0	\$14,289.0	\$14,289.0
2023	14,512.2	14,489.7	14,489.7	14,437.2	14,437.2	14,384.8
2024	14,748.5	14,695.7	14,695.7	14,642.5	14,642.5	14,589.4
2025	14,998.7	14,912.2	14,912.2	14,858.2	14,858.2	14,804.3
2026	15,257.6	15,138.3	15,138.3	15,083.5	15,083.5	15,028.8
2027	15,520.2	15,368.1	15,368.1	15,312.4	15,312.4	15,256.8

Note: Assumes a Fiscal Year ending 6/30/2021 Investment Return of 20.00% and the assumed investment return thereafter.

# Comparison of Projected System Employer Contribution Rates

Fiscal Year Ending (FYE)	Current June 30, 2020 Valuation Assumptions	Revised Demographic, 5.0% Average Salary Increase and Interest Rate Assumption/Payroll Growth (Effective FYE 2023)				
		7.25%/3.5%	7.125%/3.5%	7.00%/3.25%	6.875%/3.25%	6.75%/3.0%
2022	33.99%	33.99%	33.99%	33.99%	33.99%	33.99%
2023	34.39%	34.54%	35.38%	36.78%	37.65%	39.12%
2024	34.64%	34.88%	35.73%	37.08%	37.94%	39.36%
2025	34.87%	35.20%	36.06%	37.33%	38.20%	39.55%
2026	35.22%	35.65%	36.51%	37.73%	38.59%	39.87%
2027	35.45%	35.98%	36.84%	37.99%	38.85%	40.06%

Note: Assumes a Fiscal Year ending 6/30/2021 Investment Return of 20.00% and the assumed investment return thereafter. Without regard to the Act 5 DC contribution and Premium Assistance.



# Comparison of Total Projected System Employer Contributions

Fiscal Year Ending (FYE) (\$ millions)	Current June 30, 2020 Valuation Assumptions	Revised Demographic, 5.0% Average Salary Increase and Interest Rate Assumption/Payroll Growth (Effective FYE 2023)				
		7.25%/3.5%	7.125%/3.5%	7.00%/3.25%	6.875%/3.25%	6.75%/3.0%
2022	\$4,856.8	\$4,856.8	\$4,856.8	\$4,856.8	\$4,856.8	\$4,856.8
2023	4,990.7	5,004.7	5,126.4	5,310.0	5,435.6	5,627.3
2024	5,108.9	5,125.9	5,250.8	5,429.4	5,555.4	5,742.4
2025	5,230.0	5,249.1	5,377.3	5,546.6	5,675.8	5,855.1
2026	5,373.7	5,396.8	5,527.0	5,691.0	5,820.7	5,992.0
2027	5,501.9	5,529.4	5,661.6	5,817.2	5,948.9	6,111.9
Total	\$31,062.0	\$31,162.7	\$31,799.9	\$32,651.0	\$33,293.2	\$34,185.5

Note: Assumes a Fiscal Year ending 6/30/2021 Investment Return of 20.00% and the assumed investment return thereafter. Without regard to the Act 5 DC contribution and Premium Assistance.

# Comparison of Projected System Funded Ratio

(Based on Actuarial Value of Assets)

Fiscal Year Ending (FYE)	Current June 30, 2020 Valuation Assumptions	Revised Demographic, 4.75% Average Salary Increase and Interest Rate Assumption/Payroll Growth (Effective FYE 2021)				
		7.25%/3.5%	7.125%/3.5%	7.00%/3.25%	6.875%/3.25%	6.75%/3.0%
2020	59.2%	59.2%	59.2%	59.2%	59.2%	59.2%
2021	60.3%	59.9%	59.1%	58.4%	57.6%	56.9%
2022	61.8%	61.4%	60.5%	59.7%	58.8%	58.0%
2023	63.4%	63.0%	62.1%	61.4%	60.5%	59.8%
2024	64.9%	64.5%	63.6%	62.9%	62.1%	61.4%
2025	66.7%	66.3%	65.5%	64.8%	64.0%	63.4%

Note: Assumes a Fiscal Year ending 6/30/2021 Investment Return of 20.00% and the assumed investment return thereafter.

# Comparison of Projected System Unfunded Accrued Liability

(Based on Actuarial Value of Assets)

Fiscal Year Ending (FYE) (\$ millions)	Current June 30, 2020 Valuation Assumptions	Revised Demographic, 4.75% Average Salary Increase and Interest Rate Assumption/Payroll Growth (Effective FYE 2021)				
		7.25%/3.5%	7.125%/3.5%	7.00%/3.25%	6.875%/3.25%	6.75%/3.0%
2020	\$44,034.5	\$44,034.5	\$44,034.5	\$44,034.5	\$44,034.5	\$44,034.5
2021	43,836.6	44,487.2	45,940.9	47,408.9	48,907.7	50,438.3
2022	43,119.1	43,833.6	45,389.9	46,957.9	48,555.2	50,182.6
2023	42,161.2	42,885.3	44,431.9	45,923.4	47,506.2	49,047.2
2024	41,265.6	41,997.7	43,533.1	44,950.2	46,516.9	47,973.9
2025	39,881.5	40,592.6	42,114.9	43,460.5	45,009.1	46,385.3

Note: Assumes a Fiscal Year ending 6/30/2021 Investment Return of 20.00% and the assumed investment return thereafter.

# Comparison of Projected System Appropriation Payroll

Fiscal Year Ending (FYE) (\$ millions)	Current June 30, 2020 Valuation Assumptions	Revised Demographic, 4.75% Average Salary Increase and Interest Rate Assumption/Payroll Growth (Effective FYE 2023)				
		7.25%/3.5%	7.125%/3.5%	7.00%/3.25%	6.875%/3.25%	6.75%/3.0%
2022	\$14,289.0	\$14,289.0	\$14,289.0	\$14,289.0	\$14,289.0	\$14,289.0
2023	14,512.2	14,452.0	14,452.0	14,399.7	14,399.7	14,347.4
2024	14,748.5	14,619.4	14,619.4	14,566.5	14,566.5	14,513.6
2025	14,998.7	14,796.3	14,796.3	14,742.8	14,742.8	14,689.2
2026	15,257.6	14,981.7	14,981.7	14,927.5	14,927.5	14,873.3
2027	15,520.2	15,169.8	15,169.8	15,114.9	15,114.9	15,060.0

Note: Assumes a Fiscal Year ending 6/30/2021 Investment Return of 20.00% and the assumed investment return thereafter.

# Comparison of Projected System Employer Contribution Rates

Fiscal Year Ending (FYE)	Current June 30, 2020 Valuation Assumptions	Revised Demographic, 4.75% Average Salary Increase and Interest Rate Assumption/Payroll Growth (Effective FYE 2023)				
		7.25%/3.5%	7.125%/3.5%	7.00%/3.25%	6.875%/3.25%	6.75%/3.0%
2022	33.99%	33.99%	33.99%	33.99%	33.99%	33.99%
2023	34.39%	33.76%	34.59%	35.97%	36.82%	38.27%
2024	34.64%	34.19%	35.03%	36.34%	37.19%	38.59%
2025	34.87%	34.58%	35.43%	36.69%	37.54%	38.87%
2026	35.22%	35.13%	35.98%	37.18%	38.03%	39.29%
2027	35.45%	35.54%	36.40%	37.53%	38.39%	39.57%

Note: Assumes a Fiscal Year ending 6/30/2021 Investment Return of 20.00% and the assumed investment return thereafter. Without regard to the Act 5 DC contribution and Premium Assistance.

# Comparison of Total Projected System Employer Contributions

Fiscal Year Ending (FYE) (\$ millions)	Current June 30, 2020 Valuation Assumptions	Revised Demographic, 4.75% Average Salary Increase and Interest Rate Assumption/Payroll Growth (Effective FYE 2023)				
		7.25%/3.5%	7.125%/3.5%	7.00%/3.25%	6.875%/3.25%	6.75%/3.0%
2022	\$4,856.8	\$4,856.8	\$4,856.8	\$4,856.8	\$4,856.8	\$4,856.8
2023	4,990.7	4,879.0	4,999.0	5,179.6	5,302.0	5,490.8
2024	5,108.9	4,998.4	5,121.2	5,293.5	5,417.3	5,600.8
2025	5,230.0	5,116.6	5,242.3	5,409.1	5,534.4	5,709.7
2026	5,373.7	5,263.1	5,390.4	5,550.0	5,676.9	5,843.7
2027	5,501.9	5,391.3	5,521.8	5,672.6	5,802.6	5,959.2
Total	\$31,062.0	\$30,505.2	\$31,131.5	\$31,961.6	\$32,590.0	\$33,461.0

Note: Assumes a Fiscal Year ending 6/30/2021 Investment Return of 20.00% and the assumed investment return thereafter. Without regard to the Act 5 DC contribution and Premium Assistance.

# Comparison of Projected System Funded Ratio

(Based on Actuarial Value of Assets)

Fiscal Year Ending (FYE)	Current June 30, 2020 Valuation Assumptions	Revised Demographic, 4.5% Average Salary Increase and Interest Rate Assumption/Payroll Growth (Effective FYE 2021)				
		7.25%/3.5%	7.125%/3.5%	7.00%/3.25%	6.875%/3.25%	6.75%/3.0%
2020	59.2%	59.2%	59.2%	59.2%	59.2%	59.2%
2021	60.3%	60.3%	59.5%	58.8%	58.0%	57.2%
2022	61.8%	61.8%	61.0%	60.1%	59.3%	58.4%
2023	63.4%	63.4%	62.5%	61.7%	60.9%	60.1%
2024	64.9%	64.8%	64.0%	63.3%	62.4%	61.7%
2025	66.7%	66.6%	65.8%	65.1%	64.3%	63.6%

Note: Assumes a Fiscal Year ending 6/30/2021 Investment Return of 20.00% and the assumed investment return thereafter.

# Comparison of Projected System Unfunded Accrued Liability

(Based on Actuarial Value of Assets)

Fiscal Year Ending (FYE) (\$ millions)	Current June 30, 2020 Valuation Assumptions	Revised Demographic, 4.5% Average Salary Increase and Interest Rate Assumption/Payroll Growth (Effective FYE 2021)				
		7.25%/3.5%	7.125%/3.5%	7.00%/3.25%	6.875%/3.25%	6.75%/3.0%
2020	\$44,034.5	\$44,034.5	\$44,034.5	\$44,034.5	\$44,034.5	\$44,034.5
2021	43,836.6	43,745.7	45,186.8	46,642.1	48,128.2	49,645.8
2022	43,119.1	43,038.3	44,582.0	46,137.5	47,722.1	49,336.7
2023	42,161.2	42,084.3	43,618.6	45,099.1	46,669.5	48,199.2
2024	41,265.6	41,192.4	42,715.8	44,123.4	45,678.0	47,125.4
2025	39,881.5	39,784.4	41,295.1	42,632.8	44,169.7	45,538.0

Note: Assumes a Fiscal Year ending 6/30/2021 Investment Return of 20.00% and the assumed investment return thereafter.



# Comparison of Projected System Appropriation Payroll

Fiscal Year Ending (FYE) (\$ millions)	Current June 30, 2020 Valuation Assumptions	Revised Demographic, 4.5% Average Salary Increase and Interest Rate Assumption/Payroll Growth (Effective FYE 2023)				
		7.25%/3.5%	7.125%/3.5%	7.00%/3.25%	6.875%/3.25%	6.75%/3.0%
2022	\$14,289.0	\$14,289.0	\$14,289.0	\$14,289.0	\$14,289.0	\$14,289.0
2023	14,512.2	14,410.2	14,410.2	14,358.0	14,358.0	14,305.9
2024	14,748.5	14,535.1	14,535.1	14,482.5	14,482.5	14,429.9
2025	14,998.7	14,668.6	14,668.6	14,615.5	14,615.5	14,562.5
2026	15,257.6	14,809.8	14,809.8	14,756.2	14,756.2	14,702.6
2027	15,520.2	14,952.9	14,952.9	14,898.8	14,898.8	14,844.7

Note: Assumes a Fiscal Year ending 6/30/2021 Investment Return of 20.00% and the assumed investment return thereafter.

# Comparison of Projected System Employer Contribution Rates

Fiscal Year Ending (FYE)	Current June 30, 2020 Valuation Assumptions	Revised Demographic, 4.5% Average Salary Increase and Interest Rate Assumption/Payroll Growth (Effective FYE 2023)				
		7.25%/3.5%	7.125%/3.5%	7.00%/3.25%	6.875%/3.25%	6.75%/3.0%
2022	33.99%	33.99%	33.99%	33.99%	33.99%	33.99%
2023	34.39%	32.93%	33.75%	35.10%	35.93%	37.36%
2024	34.64%	33.45%	34.27%	35.57%	36.41%	37.78%
2025	34.87%	33.94%	34.77%	36.01%	36.85%	38.15%
2026	35.22%	34.57%	35.41%	36.59%	37.43%	38.68%
2027	35.45%	35.08%	35.92%	37.05%	37.90%	39.07%

Note: Assumes a Fiscal Year ending 6/30/2021 Investment Return of 20.00% and the assumed investment return thereafter. Without regard to the Act 5 DC contribution and Premium Assistance.

# Comparison of Total Projected System Employer Contributions

Fiscal Year Ending (FYE) (\$ millions)	Current June 30, 2020 Valuation Assumptions	Revised Demographic, 4.5% Average Salary Increase and Interest Rate Assumption/Payroll Growth (Effective FYE 2023)				
		7.25%/3.5%	7.125%/3.5%	7.00%/3.25%	6.875%/3.25%	6.75%/3.0%
2022	\$4,856.8	\$4,856.8	\$4,856.8	\$4,856.8	\$4,856.8	\$4,856.8
2023	4,990.7	4,745.3	4,863.4	5,039.7	5,158.8	5,344.7
2024	5,108.9	4,862.0	4,981.2	5,151.4	5,273.1	5,451.6
2025	5,230.0	4,978.5	5,100.3	5,263.0	5,385.8	5,555.6
2026	5,373.7	5,119.8	5,244.2	5,399.3	5,523.2	5,687.0
2027	5,501.9	5,245.5	5,371.1	5,520.0	5,646.6	5,799.8
Total	\$31,062.0	\$29,807.9	\$30,417.0	\$31,230.2	\$31,844.3	\$32,695.5

Note: Assumes a Fiscal Year ending 6/30/2021 Investment Return of 20.00% and the assumed investment return thereafter. Without regard to the Act 5 DC contribution and Premium Assistance.

# Consideration of Risk

- ASOP 51 risk - actual future measurements deviating from expected future measurements due to actual experience deviating from actuarial assumptions
- Experience studies attempt to mitigate this risk by re-evaluating the actuarial assumptions compared to past experience on a regular basis
  - Use combination of past experience, future expectations and professional judgement
- Demographic experience study addresses the risk that actual demographic experience will be different than assumed
  - Longevity risk – Members living longer than assumed increases costs
    - Mortality assumption addresses this risk
  - Risk due to option 4 withdrawal of accumulated deductions at retirement - more retirees are electing a lump sum than assumed
    - Possible liquidity issues increasing investment risk
    - For Class T-C and T-D difference in interest versus investment return rate presents an additional liability
  - Retirement risk - more retirees commencing their benefits earlier than assumed generally increases costs
    - May pay out subsidized early and superannuation benefits for a longer period of time than assumed
    - May be offset some by lower accrued benefits at retirement due to lower salary and service at retirement than assumed
  - Withdrawal prior to retirement risk – fewer members withdrawing than assumed generally increases the costs
- Contribution risk – actuarial assumptions out of line with actual experience may create losses that make contributions more volatile and expensive at times when the System sponsor is less able to afford the costs. This increases the risk of not contributing an actuarially determined contribution.

# Use of Models

Actuarial Standard of Practice No. 56 (“ASOP 56”) provides guidance to actuaries when performing actuarial services with respect to designing, developing, selecting, modifying, using, reviewing, or evaluating models. For this presentation Buck used the following:

- internally developed and third party model to compare actual versus assumed experience and determine proposed assumptions to use for valuing the liabilities in the third-party software
- third-party software to calculate the liabilities associated with the System based on current and proposed assumptions
- an internally developed model that applies applicable funding methods and policies to the liabilities derived from the output of the third-party software and other inputs, such as plan assets and contributions, to determine the contribution rates and funded ratios

Buck has an extensive review process for annual valuations whereby the results of the liability calculations are checked using detailed sample output, changes from year to year are summarized by source, and significant deviations from expectations are investigated. Other outputs and the internal model are similarly reviewed in detail and at a high level for accuracy, reasonability and consistency with prior results. The models used for annual valuations are used for this presentation and any adaptations for this presentation are checked and reviewed by experts within the company who are familiar with applicable funding methods as well as the manner in which the model generates its output. If significant changes are made to the internal model, extra checking and review are completed.

# Questions and Deliberation

- Investment Return
- Salary Increase
- Payroll growth

# PSERB Resolution

Please refer to

PSERB Resolution 2021-

Re: Five-Year Actuarial Experience Review – July 1, 2015 to June 30, 2020 –  
Economic Assumptions

August 5, 2021



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# Appendix

# Disclosures

Unless otherwise stated, the following cost projections were prepared using the same data, methods and actuarial assumptions that were used for the June 30, 2020 actuarial valuation and the following assumptions for future valuations:

1. The active workforce size is assumed to remain constant over the projection period;
2. Future new employees have similar characteristics (age/gender/salary) to new employees for the period July 1, 2017 through June 30, 2020. Among new school employees hired on or after July 1, 2020, 98% will become Class T-G members, 1% will elect Class T-H membership, and 1% will elect Class DC participation.

The cost projections reflect the ACT 5 risk-sharing provisions for TE/TF/TG/TH members. We caution that while the System assets and projected unfunded accrued liability amortization schedules reflect the over contribution from the basic member rate, the corresponding System accrued liabilities do not reflect the increase in the affected members contribution rates. Changes in the member rate influence the System's total liabilities due to incidence of return of contributions for non-vested members, Option 4 lump sum withdrawals, etc.

The resulting contributions for each fiscal year may be different from actual results that will be determined in future actuarial valuations due to demographic and financial experience different than assumed. In addition, it is outside the scope of this assignment to determine if the assumptions used in the June 30, 2020 actuarial valuation are reasonable for future valuations. Accordingly, these results should not be used for any purpose other than providing the user with an estimate of future employer pension cost obligations based on the parameters defined by the user.

Where presented, references to "funded ratio" and "unfunded accrued liability" are to measurements made on the basis of the actuarial value of assets. It should be noted that the same measurements made using the market value of assets would result in different funded ratios and unfunded accrued liabilities. Moreover, the funded ratios presented are appropriate for evaluating the need for and level of future contributions but provide no indication of the funded status of the plan if the plan were to settle (i.e., purchase annuities to cover) a portion or all of its liabilities.

Unless otherwise stated, graphical presentations assume a fiscal year ending 2021 20.0% return on market value of assets and the assumed annual rate of return thereafter.

# Current Assumptions - Projection of Contribution Rates and Funded Ratios As of June 30, 2020

Fiscal Year Ending June 30	Appropriation Payroll (\$Thousands)	DC Payroll (\$Thousands)			Fiscal Year Market Rate of Return	Member Contribution Rate	Employer Normal Cost	Employer Unfunded Liability Rate	Preliminary Employer Pension Rate	Health Care Contribution	Employer DC Contribution Rate			Total Employer Contribution Rate	Projected Total Employer Contribution (\$Thousands)	Funded Ratio	Unfunded Accrued Liability (Based on Actuarial Value of Assets & \$Millions)
		Class TG	Class TH	Class DC Only Participants							Class T-G 2.25% DC	Class T-H 2.00% DC	DC Only Participants 2.00% DC				
2019	\$ 13,775,000					7.57 %	7.59 %	25.01 %	32.60 %	0.83 %			33.43 %		58.1 %	\$ 44,134.2	
2020	13,880,000	\$ 389,350	\$ 179,700	\$ 29,950		7.59	7.49	25.87	33.36	0.84	0.06 %	0.03 %	0.00 %	34.29	<b>59.2</b>	<b>44,034.5</b>	
2021	14,078,000	720,583	332,577	55,429	7.25 %	7.61	7.37	26.14	33.51	0.82	0.12	0.05	0.01	34.51	\$ 4,858,318	59.6	44,574.4
<b>2022</b>	<b>14,289,000</b>	937,344	8,423	7,440	7.25	<b>7.56</b>	<b>7.20</b>	<b>26.79</b>	<b>33.99</b>	<b>0.80</b>	0.15	0.00	0.00	<b>34.94</b>	<b>4,992,577</b>	60.4	44,696.5
2023	14,512,183	1,444,556	13,684	12,783	7.25	7.48	6.95	27.80	34.75	0.83	0.22	0.00	0.00	35.80	5,195,362	61.2	44,633.2
2024	14,748,525	1,933,461	18,761	17,936	7.25	7.41	6.72	28.65	35.37	0.83	0.29	0.00	0.00	36.49	5,382,331	62.0	44,683.5
2025	14,998,672	2,406,053	23,666	22,905	7.25	7.34	6.50	29.50	36.00	0.82	0.36	0.00	0.00	37.18	5,577,026	63.1	44,264.3
2026	15,257,622	2,882,333	28,542	27,772	7.25	7.28	6.28	30.50	36.78	0.82	0.43	0.00	0.00	38.03	5,801,757	64.7	43,221.3
2027	15,520,222	3,365,844	33,495	32,695	7.25	7.22	6.06	31.37	37.43	0.80	0.49	0.00	0.00	38.72	6,010,112	66.3	41,982.5
2028	15,772,282	3,855,481	38,509	37,682	7.25	7.16	5.85	32.13	37.98	0.80	0.55	0.00	0.00	39.33	6,203,463	68.0	40,519.3
2029	16,014,482	4,354,858	43,621	42,754	7.25	7.10	5.63	32.97	38.60	0.79	0.61	0.01	0.01	40.02	6,409,057	70.0	38,683.1
2030	16,256,727	4,869,946	48,891	47,992	7.25	7.04	5.41	33.86	39.27	0.77	0.67	0.01	0.01	40.73	6,620,953	72.4	36,147.6
2031	16,497,526	5,402,135	54,321	53,364	7.25	6.98	5.18	34.75	39.93	0.77	0.74	0.01	0.01	41.46	6,839,189	75.1	33,162.7
2032	16,732,585	5,952,448	59,936	58,915	7.25	6.92	4.94	35.53	40.47	0.76	0.80	0.01	0.01	42.05	7,035,285	78.0	29,715.4
2033	16,963,312	6,520,300	65,721	64,638	7.25	6.86	4.71	36.32	41.03	0.76	0.86	0.01	0.01	42.67	7,238,407	81.2	25,769.5
2034	17,186,916	7,107,769	71,703	70,567	7.25	6.79	4.48	37.14	41.62	0.76	0.93	0.01	0.01	43.33	7,447,246	84.6	21,349.8
2035	17,407,895	7,718,061	77,914	76,732	7.25	6.73	4.23	37.98	42.21	0.76	1.00	0.01	0.01	43.99	7,657,277	88.3	16,362.4
2036	17,631,961	8,352,262	84,370	83,137	7.25	6.66	3.98	20.62	24.60	0.76	1.07	0.01	0.01	26.45	4,663,546	90.1	13,973.1
2037	17,855,900	9,008,799	91,049	89,785	7.25	6.59	3.73	16.45	20.18	0.76	1.14	0.01	0.01	22.10	3,946,986	91.5	12,093.7
2038	18,085,019	9,690,506	97,987	96,691	7.25	6.52	3.48	14.73	18.21	0.76	1.21	0.01	0.01	20.20	3,652,890	92.8	10,340.9
2039	18,315,769	10,398,085	105,190	103,860	7.25	6.45	3.22	12.69	15.91	0.76	1.28	0.01	0.01	17.97	3,292,139	93.9	8,791.0
2040	18,552,272	11,132,551	112,667	111,305	7.25	6.38	2.96	11.11	14.07	0.76	1.35	0.01	0.01	16.20	3,004,720	94.9	7,388.0
2041	18,796,352	11,893,351	120,407	119,035	7.25	6.30	2.71	9.70	12.41	0.76	1.42	0.01	0.01	14.61	2,745,843	95.8	6,116.5
2042	19,050,553	12,679,591	128,412	127,035	7.25	6.23	2.46	5.56	8.02	0.76	1.50	0.01	0.01	10.30	1,961,740	96.2	5,513.4
2043	19,318,401	13,489,779	136,663	135,287	7.25	6.15	2.22	4.50	6.72	0.76	1.57	0.01	0.01	9.07	1,751,592	96.5	5,053.9
2044	19,608,007	14,320,871	145,124	143,751	7.25	6.07	1.99	4.31	6.30	0.76	1.64	0.01	0.01	8.72	1,708,939	96.8	4,583.4
2045	19,927,586	15,170,751	153,784	152,425	7.25	6.00	1.77	4.81	6.58	0.76	1.71	0.02	0.02	9.09	1,811,683	97.3	3,962.6
2046	20,281,570	16,027,941	162,511	161,257	7.25	5.92	1.59	4.67	6.26	0.76	1.78	0.02	0.02	8.84	1,792,034	97.7	3,307.9
2047	20,677,326	16,894,416	171,351	170,179	7.25	5.86	1.43	3.94	5.37	0.76	1.84	0.02	0.02	8.01	1,657,190	98.1	2,735.5
2048	21,121,159	17,769,857	180,244	179,201	7.25	5.79	1.30	3.45	4.75	0.76	1.89	0.02	0.02	7.44	1,572,257	98.5	2,206.9
2049	21,617,599	18,656,785	189,289	188,354	7.25	5.73	1.20	2.95	4.15	0.76	1.94	0.02	0.02	6.89	1,490,188	98.8	1,730.4
2050	22,159,994	19,551,604	198,404	197,603	7.25	5.68	1.11	2.23	3.34	0.76	1.99	0.02	0.02	6.13	1,358,879	99.1	1,362.8
2051	22,743,778	20,444,137	207,530	206,838	7.25	5.63	1.04	1.71	2.75	0.76	2.02	0.02	0.02	5.57	1,267,461	99.3	1,073.2
2052	23,360,997	21,333,359	216,643	216,078	7.25	5.59	0.98	1.45	2.43	0.76	2.05	0.02	0.02	5.28	1,233,963	99.4	811.8
2053	24,013,120	22,217,779	225,752	225,278	7.25	5.55	0.94	1.13	2.07	0.76	2.08	0.02	0.02	4.95	1,189,030	99.6	598.9
2054	24,702,694	23,100,670	234,881	234,507	7.25	5.52	0.91	0.78	1.69	0.76	2.10	0.02	0.02	4.59	1,132,727	99.7	450.8
<b>Total</b>														<b>134,502,165</b>			

Note: Assumes an investment return of 7.25% per year for fiscal year ending 6/30/2021 and thereafter.

## Current Assumptions - Projection of Contribution Rates and Funded Ratios As of June 30, 2020

Fiscal Year Ending June 30	Appropriation Payroll (\$Thousands)	DC Payroll (\$Thousands)			Fiscal Year Market Rate of Return	Member Contribution Rate	Employer Normal Cost	Employer Unfunded Liability Rate	Preliminary Employer Pension Rate	Health Care Contribution	Employer DC Contribution Rate			Total Employer Contribution Rate	Projected Total Employer Contribution (\$Thousands)	Funded Ratio	Unfunded Accrued Liability (Based on Actuarial Value of Assets & \$Millions)
		Class TG	Class TH	Class DC Only Participants							Class T-G 2.25% DC	Class T-H 2.00% DC	DC Only Participants 2.00% DC				
2019	\$ 13,775,000					7.57 %	7.59 %	25.01 %	32.60 %	0.83 %			33.43 %		58.1 %	\$ 44,134.2	
2020	13,880,000	\$ 389,350	\$ 179,700	\$ 29,950		7.59	7.49	25.87	33.36	0.84			34.29		59.2	44,034.5	
2021	14,078,000	720,583	332,577	55,429	20.00 %	7.61	7.37	26.14	33.51	0.82	0.06 %	0.03 %	0.00 %	34.51	\$ 4,858,318	60.3	43,836.6
<b>2022</b>	<b>14,289,000</b>	937,344	8,423	7,440	7.25	<b>7.56</b>	<b>7.20</b>	<b>26.79</b>	<b>33.99</b>	<b>0.80</b>	0.15	0.00	0.00	<b>34.94</b>	<b>4,992,577</b>	61.8	43,119.1
2023	14,512,183	1,444,556	13,684	12,783	7.25	7.48	6.95	27.44	34.39	0.83	0.22	0.00	0.00	35.44	5,143,118	63.4	42,161.2
2024	14,748,525	1,933,461	18,761	17,936	7.25	7.41	6.72	27.92	34.64	0.83	0.29	0.00	0.00	35.76	5,273,819	64.9	41,265.6
2025	14,998,672	2,406,053	23,666	22,905	7.25	7.34	6.50	28.37	34.87	0.82	0.36	0.00	0.00	36.05	5,406,462	66.7	39,881.5
2026	15,257,622	2,882,333	28,542	27,772	7.25	7.28	6.28	28.94	35.22	0.82	0.43	0.00	0.00	36.47	5,563,942	69.0	37,838.1
2027	15,520,222	3,365,844	33,495	32,695	7.25	7.22	6.06	29.39	35.45	0.80	0.49	0.00	0.00	36.74	5,701,810	71.4	35,568.5
2028	15,772,282	3,855,481	38,509	37,682	7.25	7.16	5.85	29.70	35.55	0.80	0.55	0.00	0.00	36.90	5,819,920	73.9	33,090.0
2029	16,014,482	4,354,858	43,621	42,754	7.25	7.10	5.63	30.08	35.71	0.79	0.61	0.01	0.01	37.13	5,945,653	76.5	30,230.7
2030	16,256,727	4,869,946	48,891	47,992	7.25	7.04	5.41	30.50	35.91	0.77	0.67	0.01	0.01	37.37	6,075,938	79.6	26,671.5
2031	16,497,526	5,402,135	54,321	53,364	7.25	6.98	5.18	30.92	36.10	0.77	0.74	0.01	0.01	37.63	6,208,724	82.4	23,410.8
2032	16,732,585	5,952,448	59,936	58,915	7.25	6.92	4.94	31.23	36.17	0.76	0.80	0.01	0.01	37.75	6,315,821	85.3	19,805.8
2033	16,963,312	6,520,300	65,721	64,638	7.25	6.86	4.71	31.84	36.55	0.76	0.86	0.01	0.01	38.19	6,478,416	88.4	15,779.5
2034	17,186,916	7,107,769	71,703	70,567	7.25	6.79	4.48	32.49	36.97	0.76	0.93	0.01	0.01	38.68	6,648,732	91.9	11,231.7
2035	17,407,895	7,718,061	77,914	76,732	7.25	6.73	4.23	33.18	37.41	0.76	1.00	0.01	0.01	39.19	6,822,277	95.6	6,179.3
2036	17,631,961	8,352,262	84,370	83,137	7.25	6.66	3.98	33.98	38.19	0.76	1.07	0.01	0.01	40.17	7,013,151	97.3	3,796.9
2037	17,855,900	9,008,799	91,049	89,785	7.25	6.59	3.73	34.93	39.14	0.76	1.14	0.01	0.01	41.47	7,218,197	98.6	1,996.9
2038	18,085,019	9,690,506	97,987	96,691	7.25	6.52	3.48	35.96	40.28	0.76	1.21	0.01	0.01	43.01	7,443,544	99.7	396.2
2039	18,315,769	10,398,085	105,190	103,860	7.25	6.45	3.22	37.14	41.61	0.76	1.28	0.01	0.01	44.79	7,689,856	100.6	(929.2)
2040	18,552,272	11,132,551	112,667	111,305	7.25	6.38	2.96	38.48	43.14	0.76	1.35	0.01	0.01	46.73	7,957,844	101.4	(2,035.8)
2041	18,796,352	11,893,351	120,407	119,035	7.25	6.30	2.71	39.97	44.84	0.76	1.42	0.01	0.01	48.84	8,259,388	102.0	(2,940.4)
2042	19,050,553	12,679,591	128,412	127,035	7.25	6.23	2.46	(0.35)	46.67	0.76	1.50	0.01	0.01	51.01	8,606,996	102.2	(3,170.6)
2043	19,318,401	13,489,779	136,663	135,287	7.25	6.15	2.22	(1.54)	48.74	0.76	1.57	0.01	0.01	53.38	9,008,851	102.4	(3,422.9)
2044	19,608,007	14,320,871	145,124	143,751	7.25	6.07	1.99	(2.71)	51.15	0.76	1.64	0.01	0.01	55.99	9,479,713	102.6	(3,693.4)
2045	19,927,586	15,170,751	153,784	152,425	7.25	6.00	1.77	(3.98)	54.01	0.76	1.71	0.02	0.02	61.49	10,030,901	102.8	(3,979.8)
2046	20,281,570	16,027,941	162,511	161,257	7.25	5.92	1.59	(5.29)	56.44	0.76	1.78	0.02	0.02	68.01	10,689,741	103.0	(4,288.3)
2047	20,677,326	16,894,416	171,351	170,179	7.25	5.86	1.43	(6.74)	58.57	0.76	1.84	0.02	0.02	75.67	11,479,567	103.2	(4,621.1)
2048	21,121,159	17,769,857	180,244	179,201	7.25	5.79	1.30	(8.35)	61.42	0.76	1.89	0.02	0.02	84.56	12,434,734	103.5	(4,978.4)
2049	21,617,599	18,656,785	189,289	188,354	7.25	5.73	1.20	(10.09)	64.99	0.76	1.94	0.02	0.02	95.50	13,593,733	103.8	(5,362.3)
2050	22,159,994	19,551,604	198,404	197,603	7.25	5.68	1.11	(11.91)	68.88	0.76	1.99	0.02	0.02	108.99	14,914,240	104.0	(5,776.5)
2051	22,743,778	20,444,137	207,530	206,838	7.25	5.63	1.04	(13.96)	73.32	0.76	2.02	0.02	0.02	125.66	16,359,910	104.4	(6,221.9)
2052	23,360,997	21,333,359	216,643	216,078	7.25	5.59	0.98	(16.11)	78.47	0.76	2.05	0.02	0.02	146.61	17,989,726	104.2	(5,989.3)
2053	24,013,120	22,217,779	225,752	225,278	7.25	5.55	0.94	(18.36)	84.23	0.76	2.08	0.02	0.02	172.93	19,817,301	104.0	(5,737.5)
2054	24,702,694	23,100,670	234,881	234,507	7.25	5.52	0.91	(20.79)	90.81	0.76	2.10	0.02	0.02	195.01	21,741,173	103.8	(5,503.1)
<b>Total</b>														<b>114,049,094</b>			

Note: Assumes an investment return of 20.00% for fiscal year ending 6/30/2021 and 7.25% per year thereafter.

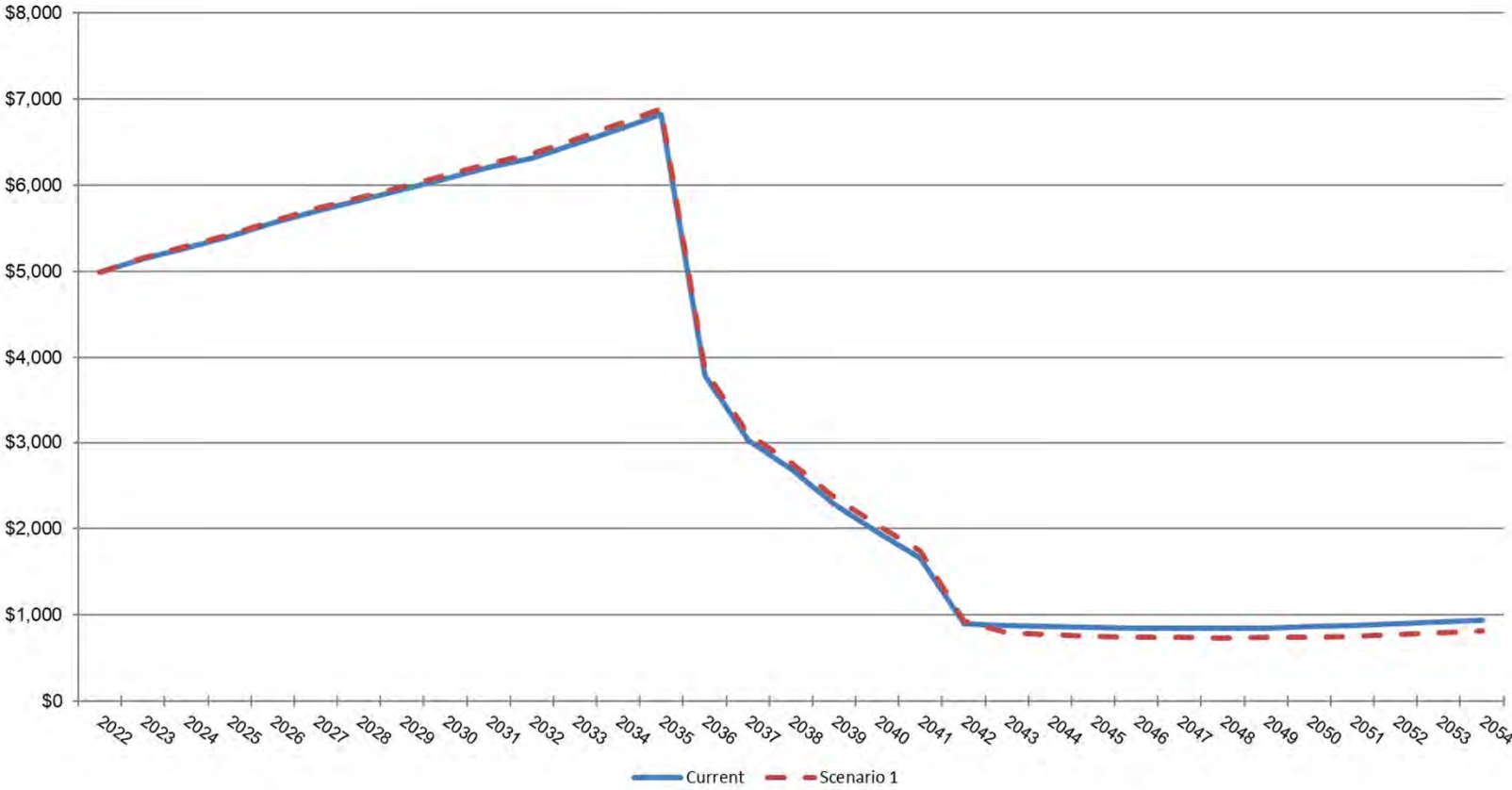
## Scenario 1 Assumptions - Projection of Contribution Rates and Funded Ratios As of June 30, 2020

### Revised Demographic, 5.0% Average Salary Increase and 7.25% Interest Rate Assumption (Effective June 30, 2021 Valuation)

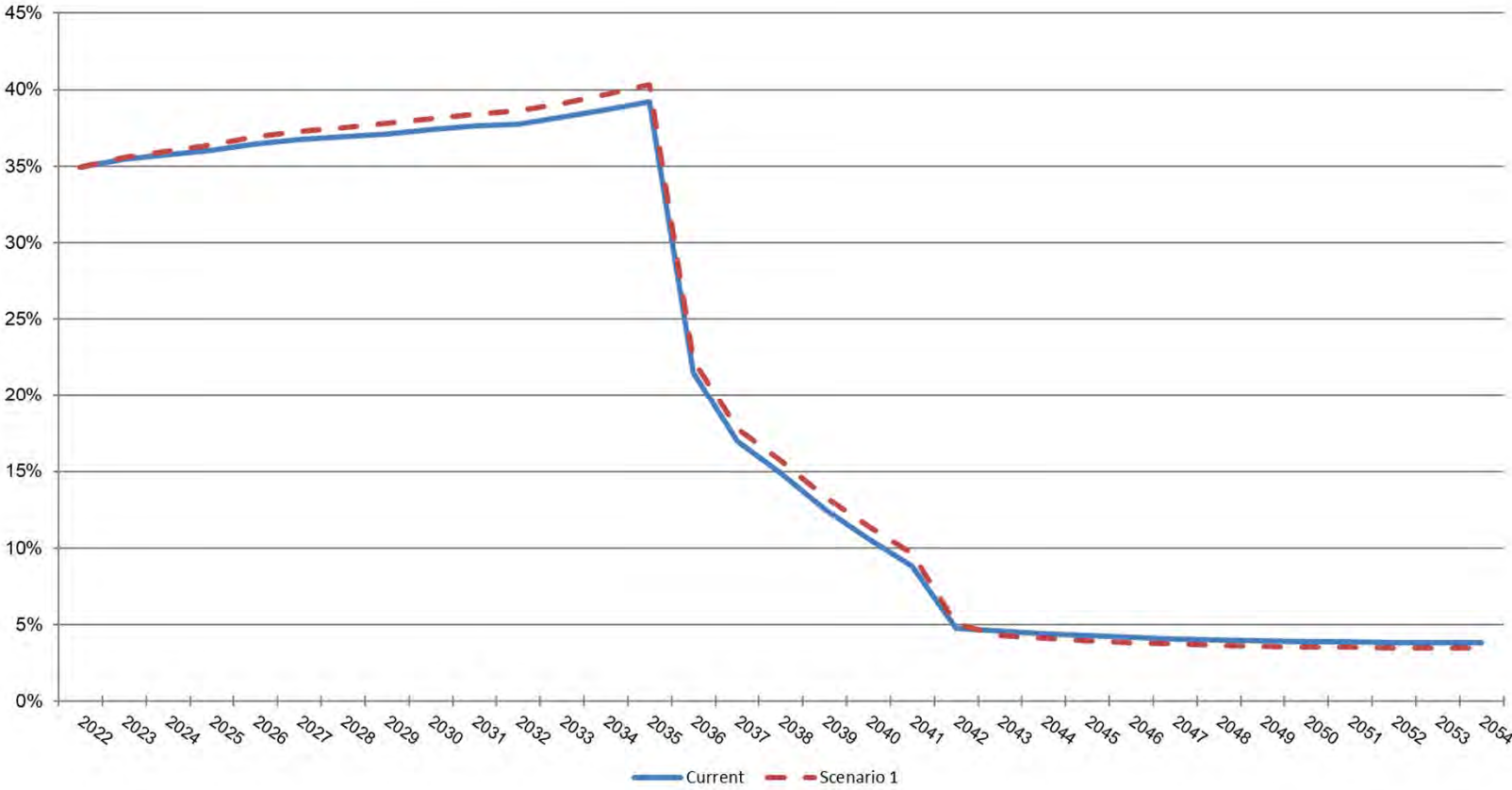
Fiscal Year Ending June 30	Appropriation Payroll (\$Thousands)	DC Payroll (\$Thousands)			Fiscal Year Market Rate of Return	Member Contribution Rate	Employer Normal Cost	Employer Unfunded Liability Rate	Preliminary Employer Pension Rate	Health Care Contribution	Employer DC Contribution Rate			Total Employer Contribution Rate	Projected Total Employer Contribution (\$Thousands)	Funded Ratio	Unfunded Accrued Liability (Based on Actuarial Value of Assets & \$Millions)
		Class TG	Class TH	Class DC Only Participants							Class T-G 2.25% DC	Class T-H 2.00% DC	DC Only Participants 2.00% DC				
2019	\$ 13,775,000					7.57 %	7.59 %	25.01 %	32.60 %	0.83 %			33.43 %		58.1 %	\$ 44,134.2	
2020	13,880,000	\$ 389,350	\$ 179,700	\$ 29,950		7.59	7.49	25.87	33.36	0.84			34.29		<b>59.2</b>	<b>44,034.5</b>	
2021	14,078,000	720,583	332,577	55,429	20.00 %	7.61	7.37	26.14	33.51	0.82	0.12	0.05	0.01	34.51	\$ 4,858,318	59.5	45,180.3
<b>2022</b>	<b>14,289,000</b>	937,344	8,423	7,440	7.25	<b>7.56</b>	<b>7.20</b>	<b>26.79</b>	<b>33.99</b>	<b>0.80</b>	0.15	0.00	0.00	<b>34.94</b>	<b>4,992,577</b>	61.0	44,576.9
2023	14,489,683	1,460,589	13,866	12,922	7.25	7.48	6.40	28.14	34.54	0.81	0.23	0.00	0.00	35.58	5,155,429	62.6	43,634.0
2024	14,695,714	1,979,991	19,255	18,365	7.25	7.39	6.20	28.68	34.88	0.81	0.30	0.00	0.00	35.99	5,289,175	64.1	42,750.4
2025	14,912,223	2,487,082	24,510	23,670	7.25	7.32	5.99	29.21	35.20	0.80	0.38	0.00	0.00	36.38	5,424,562	66.0	41,347.9
2026	15,138,324	2,985,986	29,671	28,882	7.25	7.24	5.80	29.85	35.65	0.81	0.44	0.00	0.00	36.90	5,586,615	68.3	39,304.7
2027	15,368,074	3,487,725	34,851	34,113	7.25	7.17	5.60	30.38	35.98	0.79	0.51	0.00	0.00	37.28	5,729,442	70.7	37,033.3
2028	15,598,697	3,981,530	39,944	39,257	7.25	7.11	5.39	30.75	36.14	0.79	0.57	0.01	0.01	37.52	5,852,098	73.1	34,510.6
2029	15,826,937	4,474,343	45,025	44,384	7.25	7.04	5.19	31.16	36.35	0.78	0.64	0.01	0.01	37.79	5,981,619	75.8	31,634.6
2030	16,055,055	4,964,426	50,074	49,478	7.25	6.98	4.98	31.63	36.61	0.76	0.70	0.01	0.01	38.09	6,115,967	78.8	28,056.0
2031	16,279,406	5,468,434	55,218	54,598	7.25	6.92	4.77	32.10	36.87	0.76	0.76	0.01	0.01	38.41	6,252,870	81.6	24,770.6
2032	16,497,159	5,982,297	60,465	59,802	7.25	6.86	4.56	32.45	37.01	0.75	0.82	0.01	0.01	38.60	6,367,668	84.5	21,134.8
2033	16,701,761	6,503,220	65,784	65,073	7.25	6.80	4.34	33.13	37.47	0.75	0.88	0.01	0.01	39.12	6,534,405	87.6	17,071.4
2034	16,892,751	7,034,833	71,211	70,459	7.25	6.74	4.12	33.87	37.99	0.75	0.94	0.01	0.01	39.70	6,707,078	91.0	12,543.2
2035	17,076,188	7,581,157	76,787	75,997	7.25	6.68	3.89	34.66	38.55	0.75	1.00	0.01	0.01	40.32	6,884,752	94.7	7,448.3
2036	17,257,050	8,144,005	82,530	81,706	7.25	6.62	3.65	35.63	39.29	0.75	1.06	0.01	0.01	41.00	7,073,491	98.5	5,011.3
2037	17,434,637	8,722,543	88,430	87,573	7.25	6.55	3.42	36.82	40.02	0.75	1.13	0.01	0.01	41.76	7,273,165	102.3	3,147.7
2038	17,612,513	9,317,311	94,496	93,610	7.25	6.48	3.18	38.05	40.77	0.75	1.19	0.01	0.01	42.59	7,487,212	106.1	1,473.3
2039	17,789,399	9,929,351	100,735	99,826	7.25	6.41	2.94	39.35	41.52	0.75	1.26	0.01	0.01	43.46	7,706,969	110.0	63.5
2040	17,969,439	10,558,125	107,140	106,208	7.25	6.34	2.69	40.66	42.27	0.75	1.32	0.01	0.01	44.38	7,932,335	113.9	(1,139.4)
2041	18,154,378	11,203,631	113,712	112,768	7.25	6.27	2.44	42.03	43.02	0.75	1.39	0.01	0.01	45.27	8,163,361	117.8	(2,153.0)
2042	18,348,382	11,864,651	120,445	119,490	7.25	6.19	2.21	43.44	43.77	0.75	1.45	0.01	0.01	46.20	8,400,054	121.7	(2,437.3)
2043	18,557,131	12,541,545	127,341	126,385	7.25	6.11	1.98	(0.60)	44.50	0.75	1.52	0.01	0.01	47.16	8,642,389	125.6	(2,628.9)
2044	18,787,977	13,231,947	134,374	133,420	7.25	6.04	1.75	(0.92)	45.61	0.75	1.58	0.01	0.01	48.14	8,890,307	129.5	(2,833.9)
2045	19,048,135	13,933,840	141,529	140,577	7.25	5.97	1.54	(0.54)	46.76	0.75	1.65	0.01	0.01	49.23	9,144,006	133.4	(3,049.2)
2046	19,343,418	14,641,908	148,724	147,837	7.25	5.90	1.36	(0.86)	47.94	0.75	1.70	0.02	0.02	50.34	9,403,352	137.3	(3,280.8)
2047	19,683,078	15,359,195	156,019	155,191	7.25	5.83	1.21	(2.24)	49.15	0.75	1.76	0.02	0.02	51.47	9,668,084	141.2	(3,537.8)
2048	20,071,198	16,082,342	163,349	162,605	7.25	5.77	1.08	(2.28)	50.39	0.75	1.80	0.02	0.02	52.64	9,937,613	145.1	(3,810.5)
2049	20,518,457	16,817,611	170,819	170,149	7.25	5.72	0.97	(2.39)	51.65	0.75	1.84	0.02	0.02	53.91	10,211,664	149.0	(4,102.8)
2050	21,022,492	17,566,830	178,430	177,840	7.25	5.68	0.88	(2.70)	52.94	0.75	1.88	0.02	0.02	55.24	10,490,298	152.9	(4,417.7)
2051	21,575,925	18,331,748	186,217	185,698	7.25	5.64	0.81	(2.79)	54.26	0.75	1.91	0.02	0.02	56.62	10,773,315	156.8	(4,760.0)
2052	22,176,672	19,117,724	194,216	193,787	7.25	5.60	0.77	(2.62)	55.59	0.75	1.94	0.02	0.02	58.05	11,060,184	160.7	(4,521.7)
2053	22,820,408	19,913,634	202,336	201,972	7.25	5.57	0.73	(2.52)	56.93	0.75	1.96	0.02	0.02	59.51	11,351,150	164.6	(4,274.1)
2054	23,497,477	20,711,089	210,483	210,194	7.25	5.55	0.69	(2.27)	58.27	0.75	1.98	0.02	0.02	61.00	11,645,013	168.5	(4,054.1)
<b>Total</b>														<b>113,696,864</b>			

Note: Assumes an investment return of 20.00% for fiscal year ending 6/30/2021 and 7.25% per year thereafter.

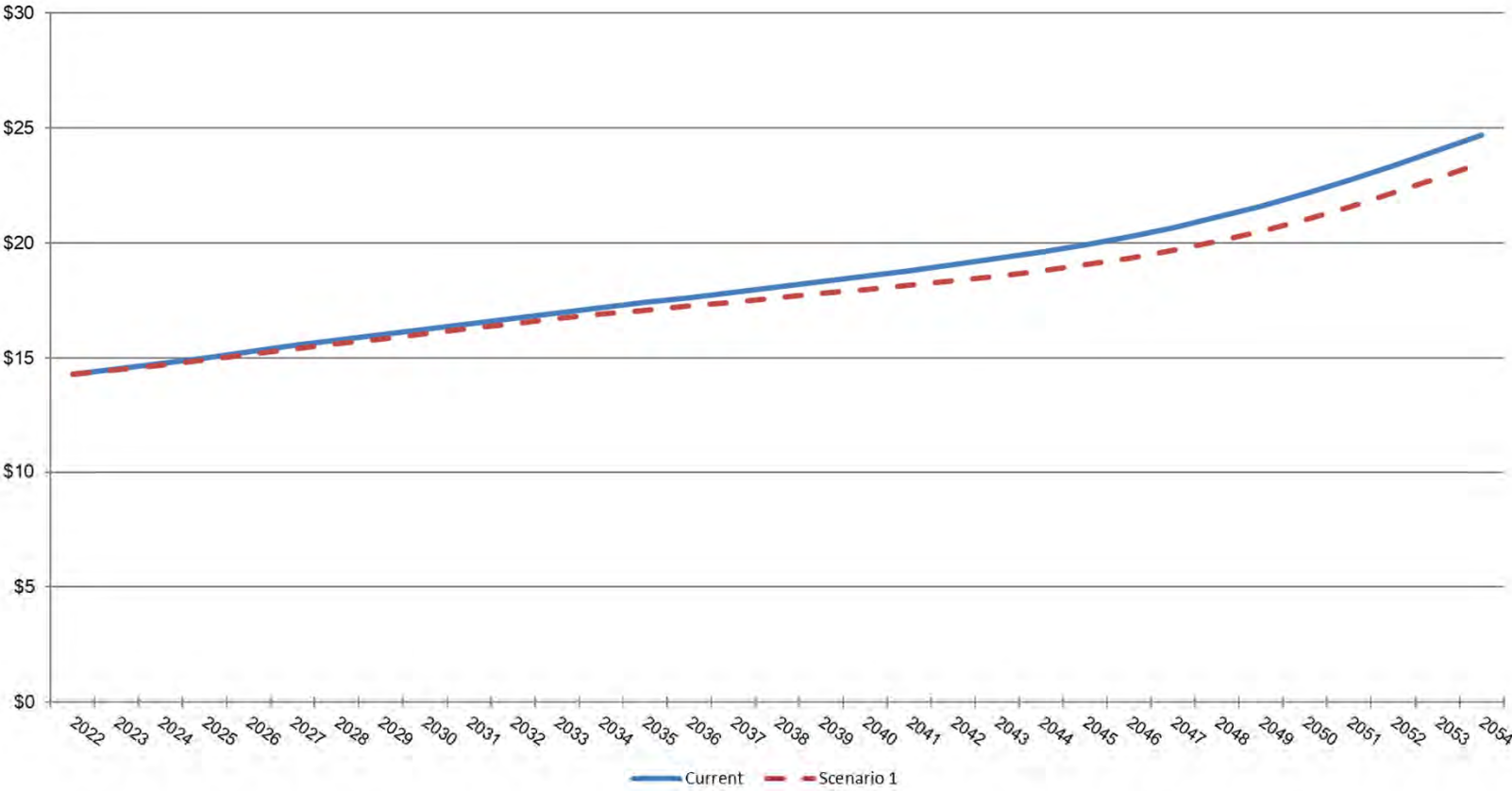
**Scenario 1 Assumptions - Comparison of Projected System Employer Contribution Amounts (Millions)**  
 Revised Demographic, 5.0% Average Salary Increase and 7.25% Interest Rate Assumption (Effective June 30, 2021 Valuation)



**Scenario 1 Assumptions - Comparison of Projected System Employer Contribution Rates**  
 Revised Demographic, 5.0% Average Salary Increase and 7.25% Interest Rate Assumption (Effective June 30, 2021 Valuation)



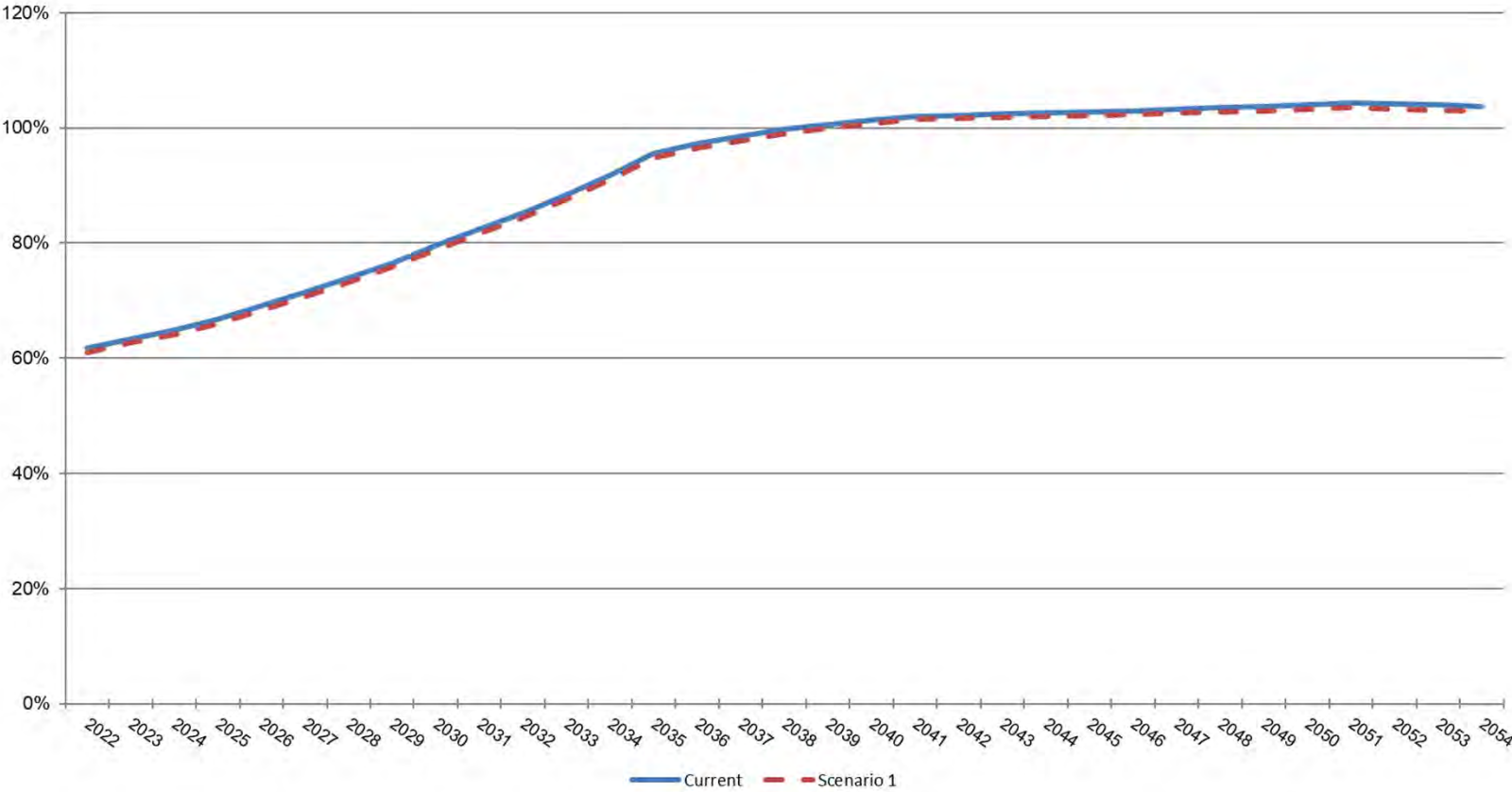
**Scenario 1 Assumptions - Comparison of Projected System Appropriation Payroll (Billions)**  
 Revised Demographic, 5.0% Average Salary Increase and 7.25% Interest Rate Assumption (Effective June 30, 2021 Valuation)



Note: Assumes a 3.50% annual payroll growth.

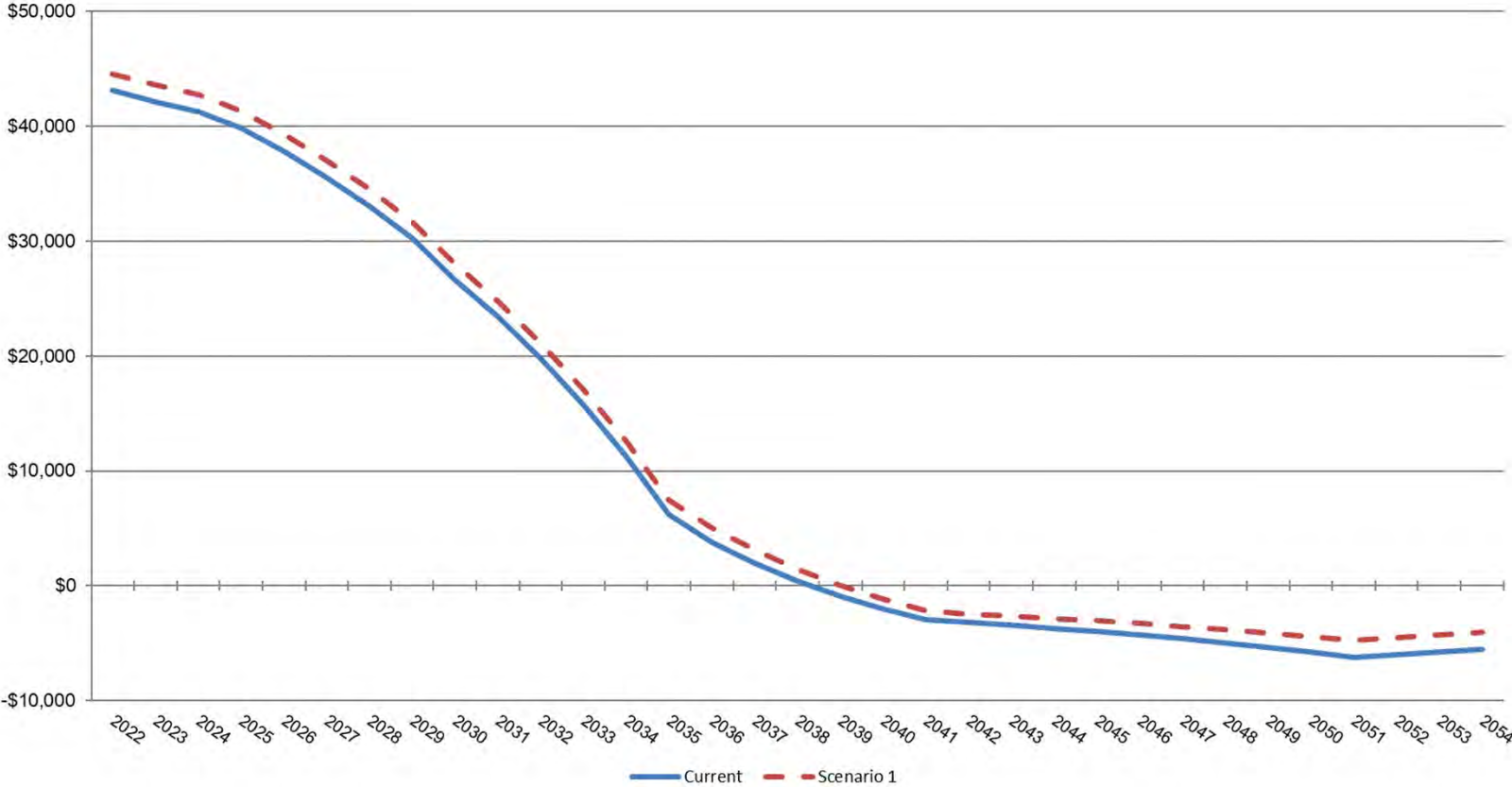


**Scenario 1 Assumptions - Comparison of Projected System Funded Ratio (Actuarial Value of Assets)**  
Revised Demographic, 5.0% Average Salary Increase and 7.25% Interest Rate Assumption (Effective June 30, 2021 Valuation)



# Scenario 1 Assumptions - Comparison of Projected System Unfunded Accrued Liability (Actuarial Value of Assets and in Millions)

Revised Demographic, 5.0% Average Salary Increase and 7.25% Interest Rate Assumption (Effective June 30, 2021 Valuation)



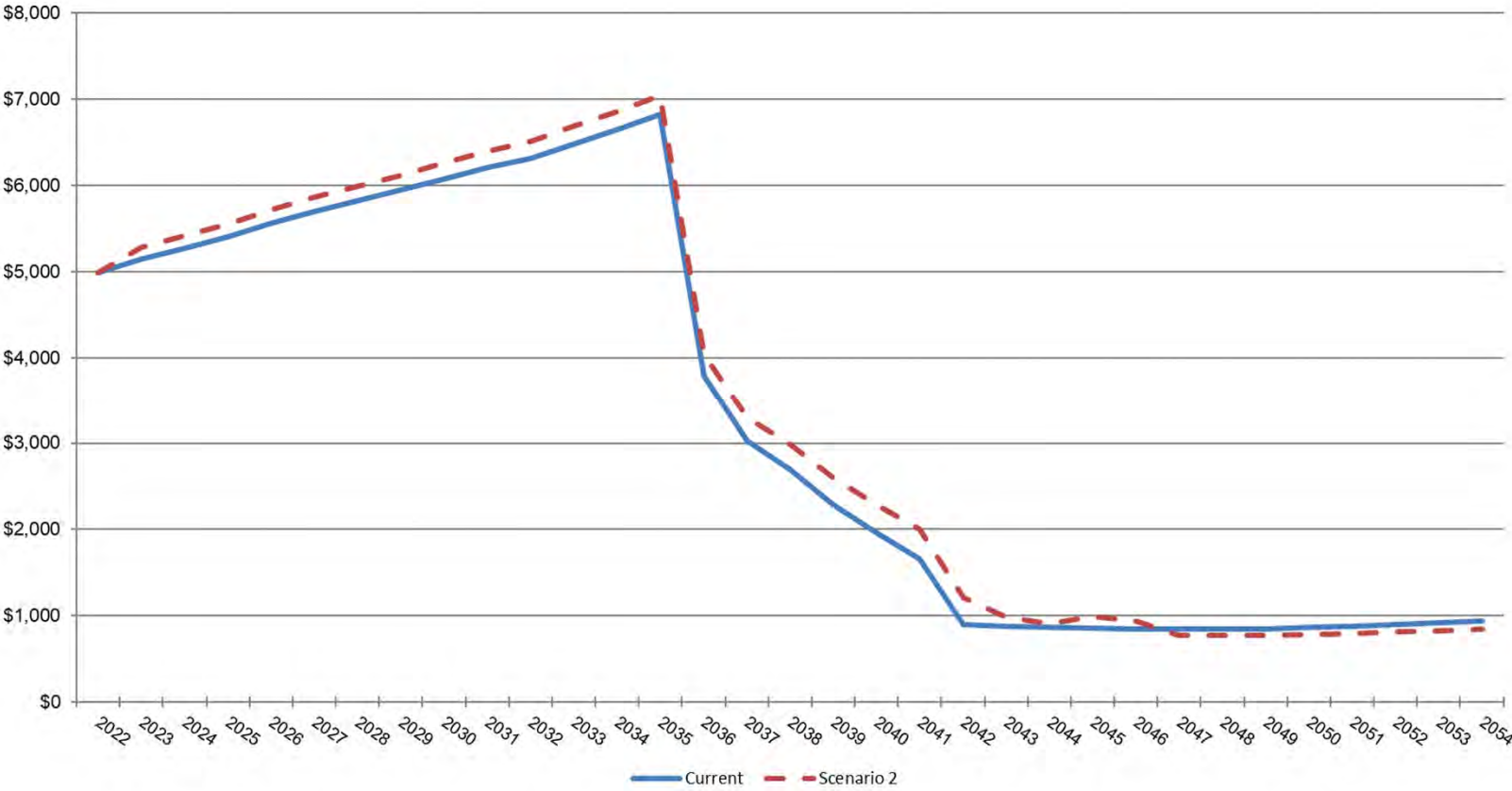
## Scenario 2 Assumptions - Projection of Contribution Rates and Funded Ratios As of June 30, 2020

### Revised Demographic, 5.0% Average Salary Increase and 7.125% Interest Rate Assumption (Effective June 30, 2021 Valuation)

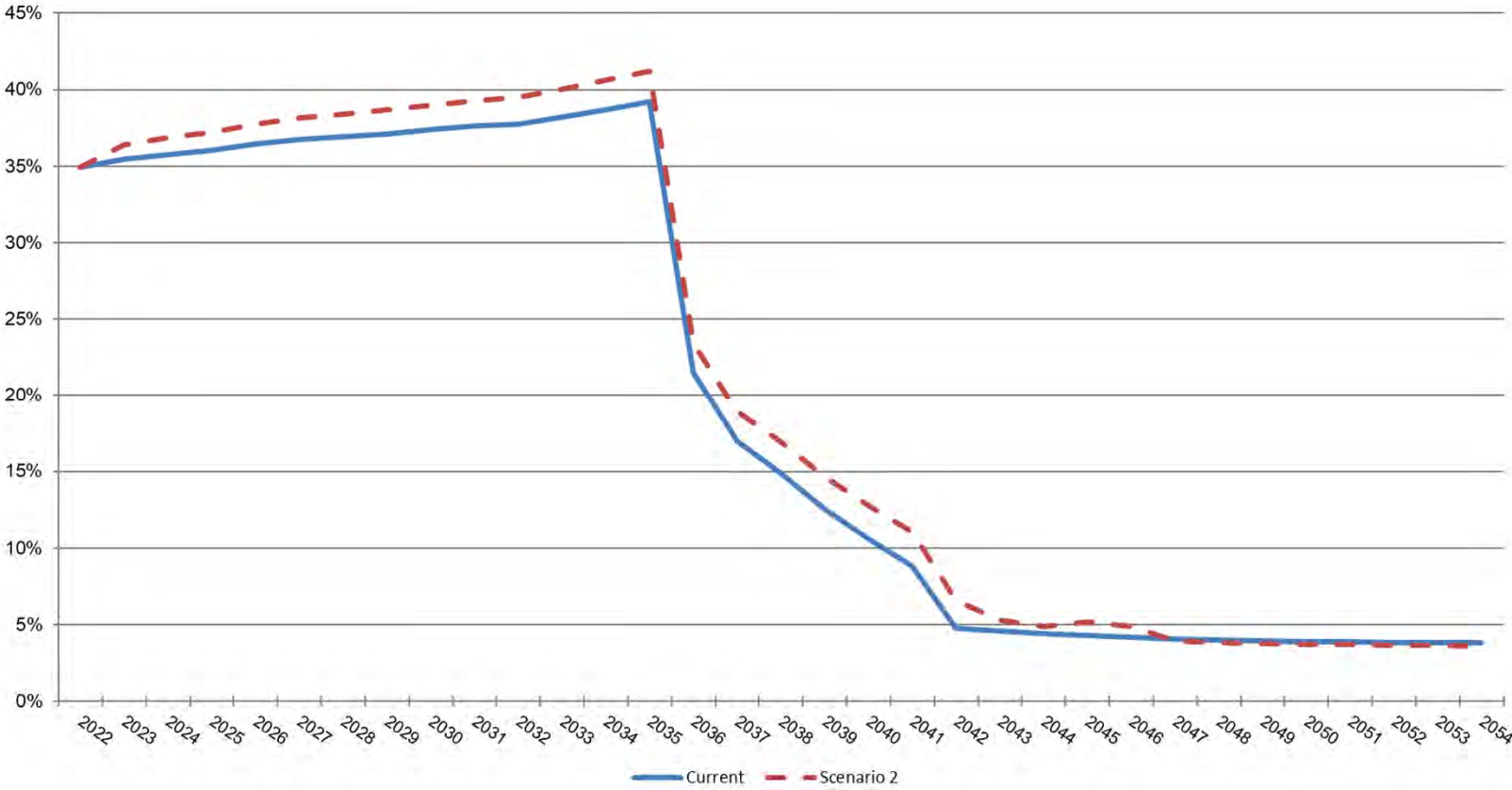
Fiscal Year Ending June 30	Appropriation Payroll (\$Thousands)	DC Payroll (\$Thousands)			Fiscal Year Market Rate of Return	Member Contribution Rate	Employer Normal Cost	Employer Unfunded Liability Rate	Preliminary Employer Pension Rate	Health Care Contribution	Employer DC Contribution Rate			Total Employer Contribution Rate	Projected Total Employer Contribution (\$Thousands)	Funded Ratio	Unfunded Accrued Liability (Based on Actuarial Value of Assets & \$Millions)
		Class TG	Class TH	Class DC Only Participants							Class T-G 2.25% DC	Class T-H 2.00% DC	DC Only Participants 2.00% DC				
2019	\$ 13,775,000					7.57 %	7.59 %	25.01 %	32.60 %	0.83 %			33.43 %		58.1 %	\$ 44,134.2	
2020	13,880,000	\$ 389,350	\$ 179,700	\$ 29,950		7.59	7.49	25.87	33.36	0.84			34.29		<b>59.2</b>	<b>44,034.5</b>	
2021	14,078,000	720,583	332,577	55,429	20.00 %	7.61	7.37	26.14	33.51	0.82	0.12	0.05	0.01	34.51	\$ 4,858,318	58.8	46,645.6
<b>2022</b>	<b>14,289,000</b>	937,344	8,423	7,440	7.125	<b>7.56</b>	<b>7.20</b>	<b>26.79</b>	<b>33.99</b>	<b>0.80</b>	0.15	0.00	0.00	<b>34.94</b>	<b>4,992,577</b>	60.1	46,144.8
2023	14,489,683	1,460,589	13,866	12,922	7.125	7.48	6.78	28.60	35.38	0.81	0.23	0.00	0.00	36.42	5,277,143	61.8	45,192.0
2024	14,695,714	1,979,991	19,255	18,365	7.125	7.39	6.58	29.15	35.73	0.81	0.30	0.00	0.00	36.84	5,413,850	63.3	44,297.0
2025	14,912,223	2,487,082	24,510	23,670	7.125	7.32	6.37	29.69	36.06	0.80	0.38	0.00	0.00	37.24	5,552,604	65.2	42,881.1
2026	15,138,324	2,985,986	29,671	28,882	7.125	7.24	6.17	30.34	36.51	0.81	0.44	0.00	0.00	37.76	5,716,399	67.5	40,823.3
2027	15,368,074	3,487,725	34,851	34,113	7.125	7.17	5.96	30.88	36.84	0.79	0.51	0.00	0.00	38.14	5,861,322	69.9	38,536.4
2028	15,598,697	3,981,530	39,944	39,257	7.125	7.11	5.74	31.26	37.00	0.79	0.57	0.01	0.01	38.38	5,986,539	72.3	35,997.0
2029	15,826,937	4,474,343	45,025	44,384	7.125	7.04	5.53	31.69	37.22	0.78	0.64	0.01	0.01	38.66	6,118,642	75.0	33,103.2
2030	16,055,055	4,964,426	50,074	49,478	7.125	6.98	5.32	32.17	37.49	0.76	0.70	0.01	0.01	38.97	6,257,197	78.0	29,506.0
2031	16,279,406	5,468,434	55,218	54,598	7.125	6.92	5.10	32.65	37.75	0.76	0.76	0.01	0.01	39.29	6,396,876	80.8	26,201.6
2032	16,497,159	5,982,297	60,465	59,802	7.125	6.86	4.88	33.02	37.90	0.75	0.82	0.01	0.01	39.49	6,514,865	83.7	22,545.4
2033	16,701,761	6,503,220	65,784	65,073	7.125	6.80	4.66	33.72	38.38	0.75	0.88	0.01	0.01	40.03	6,685,867	86.8	18,460.9
2034	16,892,751	7,034,833	71,211	70,459	7.125	6.74	4.43	34.48	38.91	0.75	0.94	0.01	0.01	40.62	6,861,177	90.1	13,911.3
2035	17,076,188	7,581,157	76,787	75,997	7.125	6.68	4.19	35.28	39.47	0.75	1.00	0.01	0.01	41.24	7,041,531	93.8	8,858.9
2036	17,257,050	8,144,005	82,530	81,706	7.125	6.62	3.94	35.73	40.00	0.75	1.06	0.01	0.01	41.91	7,228,999	97.5	6,449.9
2037	17,434,637	8,722,543	88,430	87,573	7.125	6.55	3.70	36.28	40.62	0.75	1.13	0.01	0.01	42.64	7,418,549	101.5	4,607.9
2038	17,612,513	9,317,311	94,496	93,610	7.125	6.48	3.45	36.93	41.31	0.75	1.19	0.01	0.01	43.41	7,619,999	105.5	2,950.3
2039	17,789,399	9,929,351	100,735	99,826	7.125	6.41	3.20	37.68	42.06	0.75	1.26	0.01	0.01	44.24	7,837,999	109.9	1,550.6
2040	17,969,439	10,558,125	107,140	106,208	7.125	6.34	2.94	38.53	42.87	0.75	1.32	0.01	0.01	45.11	8,072,999	114.9	350.2
2041	18,154,378	11,203,631	113,712	112,768	7.125	6.26	2.69	39.48	43.73	0.75	1.39	0.01	0.01	46.03	8,325,999	120.5	(669.8)
2042	18,348,382	11,864,651	120,445	119,490	7.125	6.19	2.44	40.53	44.64	0.75	1.45	0.01	0.01	47.00	8,596,999	126.7	(976.4)
2043	18,557,131	12,541,545	127,341	126,385	7.125	6.11	2.20	41.68	45.60	0.75	1.52	0.01	0.01	48.03	8,884,999	133.4	(1,087.9)
2044	18,787,977	13,231,947	134,374	133,420	7.125	6.04	1.96	42.91	46.61	0.75	1.58	0.01	0.01	49.11	9,188,999	140.6	(1,154.7)
2045	19,048,135	13,933,840	141,529	140,577	7.125	5.97	1.74	44.23	47.67	0.75	1.65	0.01	0.01	50.24	9,502,999	148.3	(1,311.6)
2046	19,343,418	14,641,908	148,724	147,837	7.125	5.90	1.55	45.64	48.78	0.75	1.70	0.02	0.02	51.41	9,827,999	156.9	(1,440.0)
2047	19,683,078	15,359,195	156,019	155,191	7.125	5.83	1.39	47.13	49.93	0.75	1.76	0.02	0.02	52.63	10,164,999	166.4	(1,416.9)
2048	20,071,198	16,082,342	163,349	162,605	7.125	5.77	1.25	48.62	51.13	0.75	1.80	0.02	0.02	53.89	10,514,999	176.7	(1,381.9)
2049	20,518,457	16,817,611	170,819	170,149	7.125	5.72	1.14	49.15	52.38	0.75	1.84	0.02	0.02	55.17	10,878,999	187.7	(1,337.0)
2050	21,022,492	17,566,830	178,430	177,840	7.125	5.68	1.04	49.72	53.67	0.75	1.88	0.02	0.02	56.47	11,257,999	199.3	(1,283.0)
2051	21,575,925	18,331,748	186,217	185,698	7.125	5.63	0.99	50.33	54.99	0.75	1.91	0.02	0.02	57.79	11,652,999	211.5	(1,222.1)
2052	22,176,672	19,117,724	194,216	193,787	7.125	5.60	0.93	51.00	56.33	0.75	1.94	0.02	0.02	59.13	12,066,999	224.3	(823.7)
2053	22,820,408	19,913,634	202,336	201,972	7.125	5.57	0.88	51.70	57.69	0.75	1.96	0.02	0.02	60.49	12,498,999	237.6	(435.0)
2054	23,497,477	20,711,089	210,483	210,194	7.125	5.55	0.84	52.43	59.06	0.75	1.98	0.02	0.02	61.87	12,948,999	251.4	(78.3)
<b>Total</b>														<b>118,169,216</b>			

Note: Assumes an investment return of 20.00% for fiscal year ending 6/30/2021 and 7.125% per year thereafter.

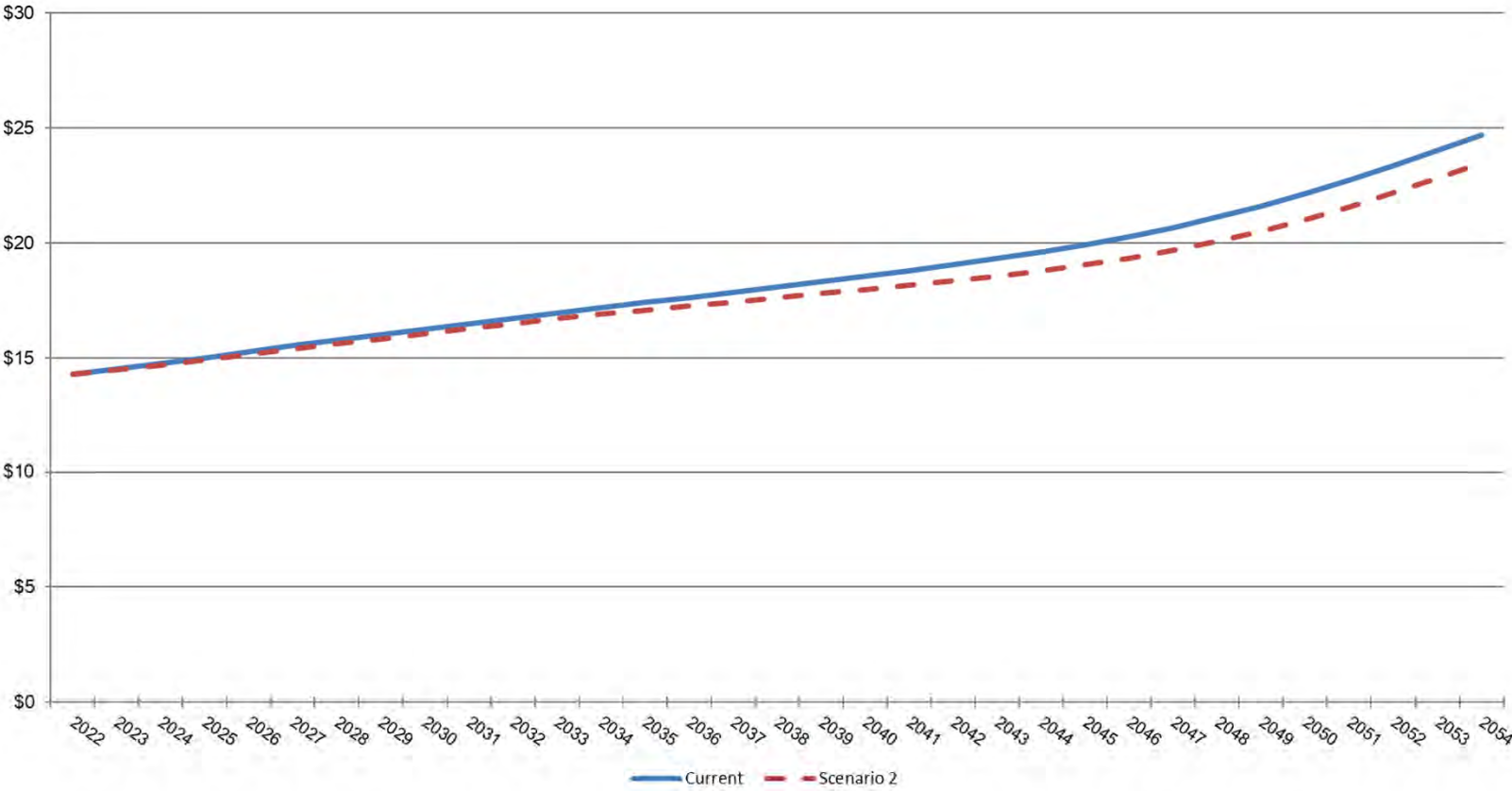
**Scenario 2 Assumptions - Comparison of Projected System Employer Contribution Amounts (Millions)**  
 Revised Demographic, 5.0% Average Salary Increase and 7.125% Interest Rate Assumption (Effective June 30, 2021 Valuation)



**Scenario 2 Assumptions - Comparison of Projected System Employer Contribution Rates**  
 Revised Demographic, 5.0% Average Salary Increase and 7.125% Interest Rate Assumption (Effective June 30, 2021 Valuation)

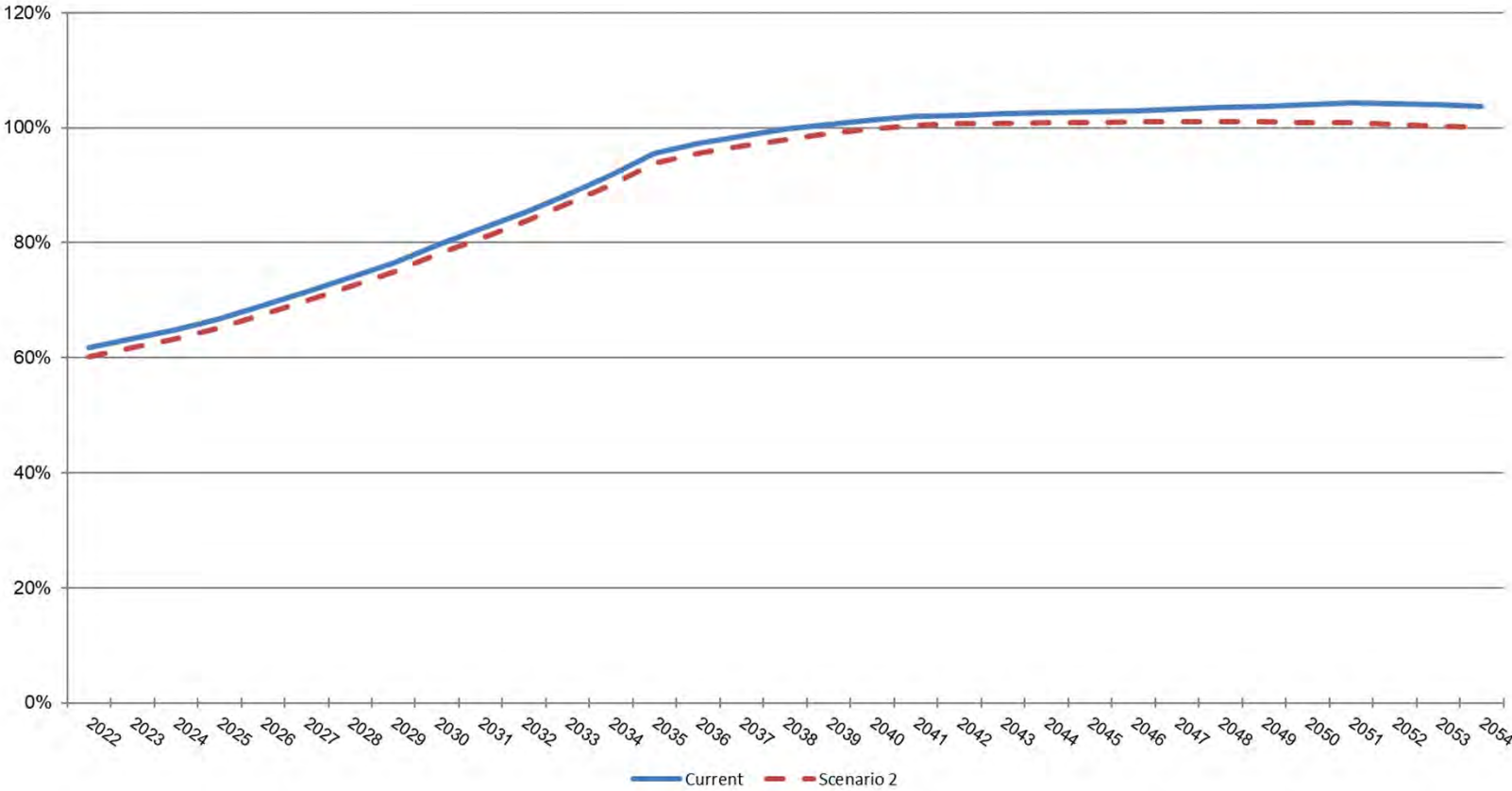


**Scenario 2 Assumptions - Comparison of Projected System Appropriation Payroll (Billions)**  
 Revised Demographic, 5.0% Average Salary Increase and 7.125% Interest Rate Assumption (Effective June 30, 2021 Valuation)



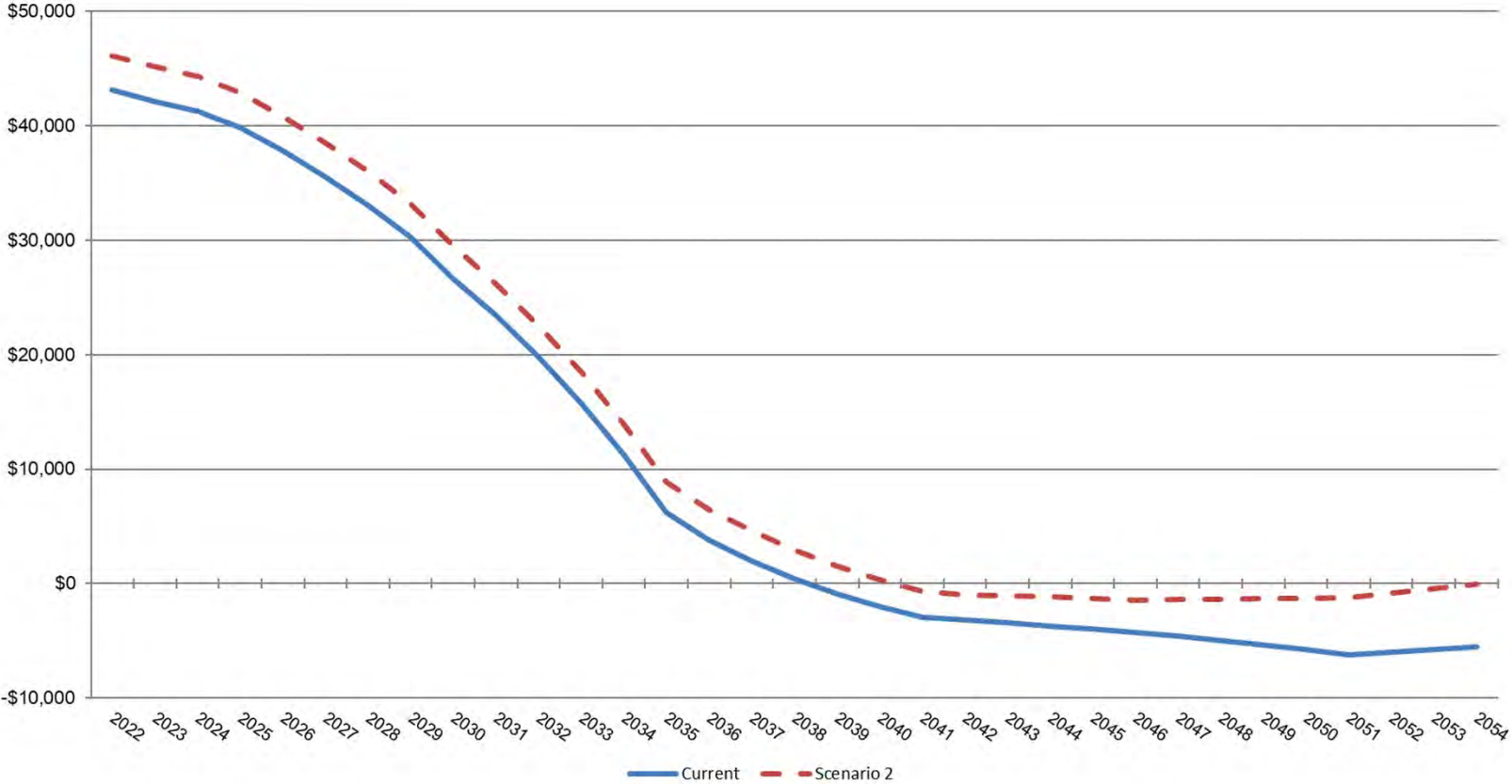
Note: Assumes a 3.50% annual payroll growth.

**Scenario 2 Assumptions - Comparison of Projected System Funded Ratio (Actuarial Value of Assets)**  
 Revised Demographic, 5.0% Average Salary Increase and 7.125% Interest Rate Assumption (Effective June 30, 2021 Valuation)



# Scenario 2 Assumptions - Comparison of Projected System Unfunded Accrued Liability (Actuarial Value of Assets and in Millions)

Revised Demographic, 5.0% Average Salary Increase and 7.125% Interest Rate Assumption (Effective June 30, 2021 Valuation)





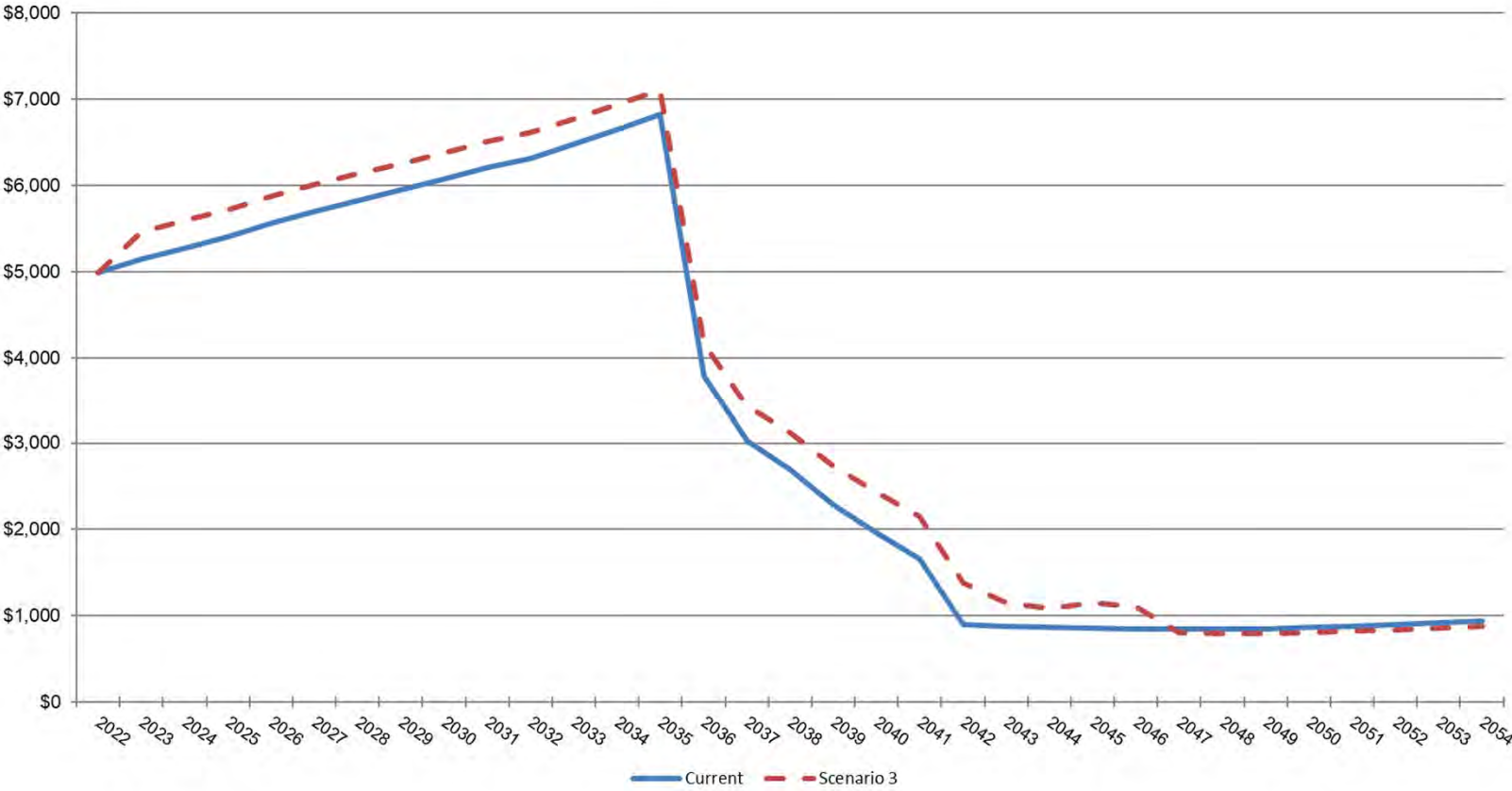
## Scenario 3 Assumptions - Projection of Contribution Rates and Funded Ratios As of June 30, 2020

Revised Demographic, 5.0% Average Salary Increase and 7.00% Interest Rate Assumption (Effective June 30, 2021 Valuation)

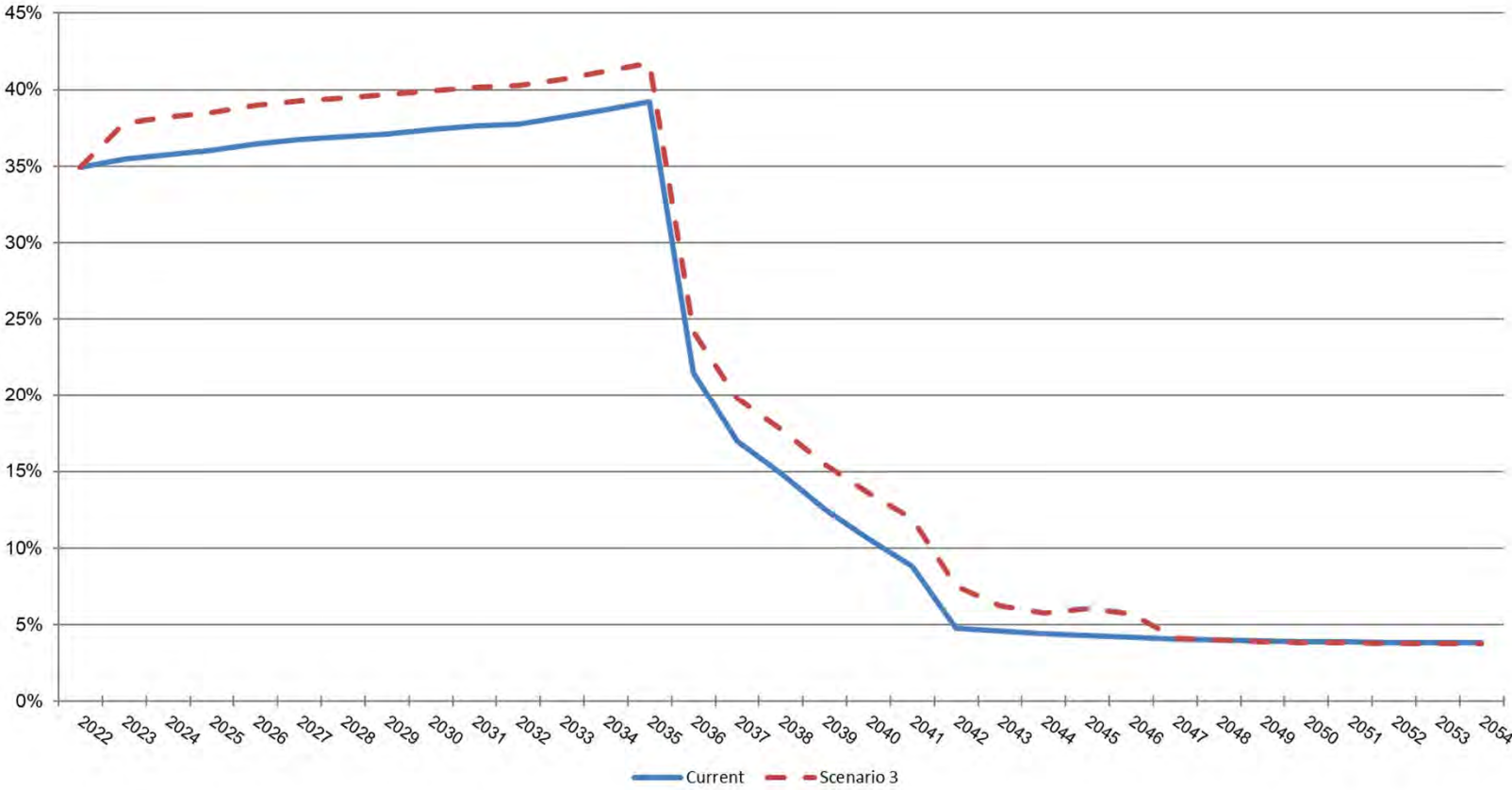
Fiscal Year Ending June 30	Appropriation Payroll (\$Thousands)	DC Payroll (\$Thousands)			Fiscal Year Market Rate of Return	Member Contribution Rate	Employer Normal Cost	Employer Unfunded Liability Rate	Preliminary Employer Pension Rate	Health Care Contribution	Employer DC Contribution Rate			Total Employer Contribution Rate	Projected Total Employer Contribution (\$Thousands)	Funded Ratio	Unfunded Accrued Liability (Based on Actuarial Value of Assets & \$Millions)
		Class TG	Class TH	Class DC Only Participants							Class T-G 2.25% DC	Class T-H 2.00% DC	DC Only Participants 2.00% DC				
2019	\$ 13,775,000					7.57 %	7.59 %	25.01 %	32.60 %	0.83 %			33.43 %		58.1 %	\$ 44,134.2	
2020	13,880,000	\$ 389,350	\$ 179,700	\$ 29,950		7.59	7.49	25.87	33.36	0.84			34.29		59.2	44,034.5	
2021	14,078,000	720,583	332,577	55,429	20.00 %	7.61	7.37	26.14	33.51	0.82	0.12	0.05	0.01	34.51	\$ 4,858,318	58.0	48,125.3
<b>2022</b>	<b>14,289,000</b>	937,344	8,423	7,440	7.00	<b>7.56</b>	<b>7.20</b>	<b>26.79</b>	<b>33.99</b>	<b>0.80</b>	0.15	0.00	0.00	<b>34.94</b>	<b>4,992,577</b>	59.3	47,724.5
2023	14,437,216	1,455,300	13,816	12,875	7.00	7.48	7.17	29.61	36.78	0.81	0.23	0.00	0.00	37.82	5,460,155	61.0	46,693.7
2024	14,642,501	1,972,822	19,186	18,299	7.00	7.39	6.97	30.11	37.08	0.82	0.30	0.00	0.00	38.20	5,593,618	62.6	45,722.8
2025	14,858,226	2,478,077	24,421	23,584	7.00	7.32	6.74	30.59	37.33	0.81	0.38	0.00	0.00	38.52	5,723,609	64.5	44,233.9
2026	15,083,508	2,975,173	29,564	28,778	7.00	7.24	6.54	31.19	37.73	0.81	0.44	0.00	0.00	38.98	5,879,724	66.9	42,107.3
2027	15,312,426	3,475,096	34,725	33,989	7.00	7.17	6.32	31.67	37.99	0.79	0.51	0.00	0.00	39.29	6,016,136	69.3	39,757.5
2028	15,542,214	3,967,113	39,799	39,114	7.00	7.11	6.09	31.98	38.07	0.79	0.57	0.01	0.01	39.45	6,131,904	71.8	37,162.8
2029	15,769,628	4,458,141	44,862	44,223	7.00	7.04	5.88	32.35	38.23	0.78	0.64	0.01	0.01	39.67	6,255,555	74.4	34,222.5
2030	15,996,920	4,946,450	49,893	49,299	7.00	6.98	5.65	32.76	38.41	0.76	0.70	0.01	0.01	39.89	6,381,899	77.5	30,589.3
2031	16,220,458	5,448,633	55,018	54,400	7.00	6.92	5.43	33.18	38.61	0.76	0.76	0.01	0.01	40.15	6,511,786	80.2	27,261.7
2032	16,437,422	5,960,634	60,246	59,585	7.00	6.86	5.20	33.47	38.67	0.75	0.82	0.01	0.01	40.26	6,617,387	83.1	23,596.2
2033	16,641,284	6,479,672	65,545	64,838	7.00	6.80	4.96	34.10	39.06	0.75	0.88	0.01	0.01	40.71	6,774,045	86.2	19,517.9
2034	16,831,582	7,009,360	70,953	70,204	7.00	6.74	4.72	34.78	39.50	0.75	0.94	0.01	0.01	41.21	6,935,749	89.5	14,992.5
2035	17,014,355	7,553,705	76,509	75,721	7.00	6.68	4.48	35.50	39.98	0.75	1.00	0.01	0.01	41.75	7,103,263	93.1	9,920.9
2036	17,194,562	8,114,515	82,231	81,410	7.00	6.62	4.22	36.15	40.27	0.75	1.06	0.01	0.01	42.29	7,279,724	96.9	7,426.1
2037	17,371,506	8,690,958	88,110	87,255	7.00	6.55	3.97	36.81	40.56	0.75	1.13	0.01	0.01	42.81	7,459,724	100.7	5,476.9
2038	17,548,738	9,283,573	94,154	93,271	7.00	6.48	3.71	37.49	40.84	0.75	1.19	0.01	0.01	43.33	7,644,724	104.5	3,697.9
2039	17,724,984	9,893,397	100,370	99,464	7.00	6.41	3.44	38.18	41.11	0.75	1.26	0.01	0.01	43.84	7,834,724	108.3	2,158.4
2040	17,904,372	10,519,894	106,752	105,824	7.00	6.34	3.17	38.87	41.37	0.75	1.32	0.01	0.01	44.34	8,029,724	112.1	799.4
2041	18,088,641	11,163,062	113,300	112,360	7.00	6.26	2.91	39.57	41.62	0.75	1.39	0.01	0.01	44.83	8,229,724	115.9	(399.5)
2042	18,281,943	11,821,690	120,009	119,057	7.00	6.19	2.64	40.27	41.86	0.75	1.45	0.01	0.01	45.31	8,434,724	119.7	(926.8)
2043	18,489,936	12,496,133	126,880	125,927	7.00	6.11	2.39	40.97	42.09	0.75	1.52	0.01	0.01	45.78	8,644,724	123.5	(1,285.7)
2044	18,719,946	13,184,034	133,888	132,937	7.00	6.04	2.15	41.68	42.31	0.75	1.58	0.01	0.01	46.24	8,859,724	127.3	(1,622.7)
2045	18,979,162	13,883,386	141,017	140,068	7.00	5.97	1.92	42.39	42.52	0.75	1.65	0.01	0.01	46.69	9,079,724	131.1	(2,068.3)
2046	19,273,376	14,588,890	148,186	147,302	7.00	5.90	1.72	43.08	42.73	0.75	1.70	0.02	0.02	47.13	9,304,724	134.9	(2,509.8)
2047	19,611,806	15,303,580	155,454	154,629	7.00	5.83	1.55	(1.97)	(0.42)	0.75	1.76	0.02	0.02	47.57	9,534,724	138.7	(2,701.8)
2048	19,998,520	16,024,107	162,758	162,016	7.00	5.77	1.40	(1.95)	(0.55)	0.75	1.80	0.02	0.02	47.99	9,769,724	142.5	(2,903.9)
2049	20,444,160	16,756,714	170,201	169,533	7.00	5.72	1.28	(2.03)	(0.75)	0.75	1.84	0.02	0.02	48.40	10,009,724	146.3	(3,119.9)
2050	20,946,370	17,503,221	177,784	177,196	7.00	5.68	1.18	(2.30)	(1.12)	0.75	1.88	0.02	0.02	48.80	10,254,724	150.1	(3,352.2)
2051	21,497,798	18,265,368	185,542	185,026	7.00	5.63	1.12	(2.37)	(1.25)	0.75	1.91	0.02	0.02	49.19	10,504,724	153.9	(3,604.8)
2052	22,096,371	19,048,500	193,512	193,085	7.00	5.60	1.06	(2.19)	(1.13)	0.75	1.94	0.02	0.02	49.57	10,759,724	157.7	(3,372.6)
2053	22,737,775	19,841,526	201,603	201,241	7.00	5.57	1.01	(2.06)	(1.05)	0.75	1.96	0.02	0.02	49.94	11,019,724	161.5	(3,138.9)
2054	23,412,392	20,636,093	209,721	209,433	7.00	5.55	0.97	(1.83)	(0.86)	0.75	1.98	0.02	0.02	50.30	11,284,724	165.3	(2,934.6)
<b>Total</b>														<b>121,733,536</b>			

Note: Assumes an investment return of 20.00% for fiscal year ending 6/30/2021 and 7.00% per year thereafter.

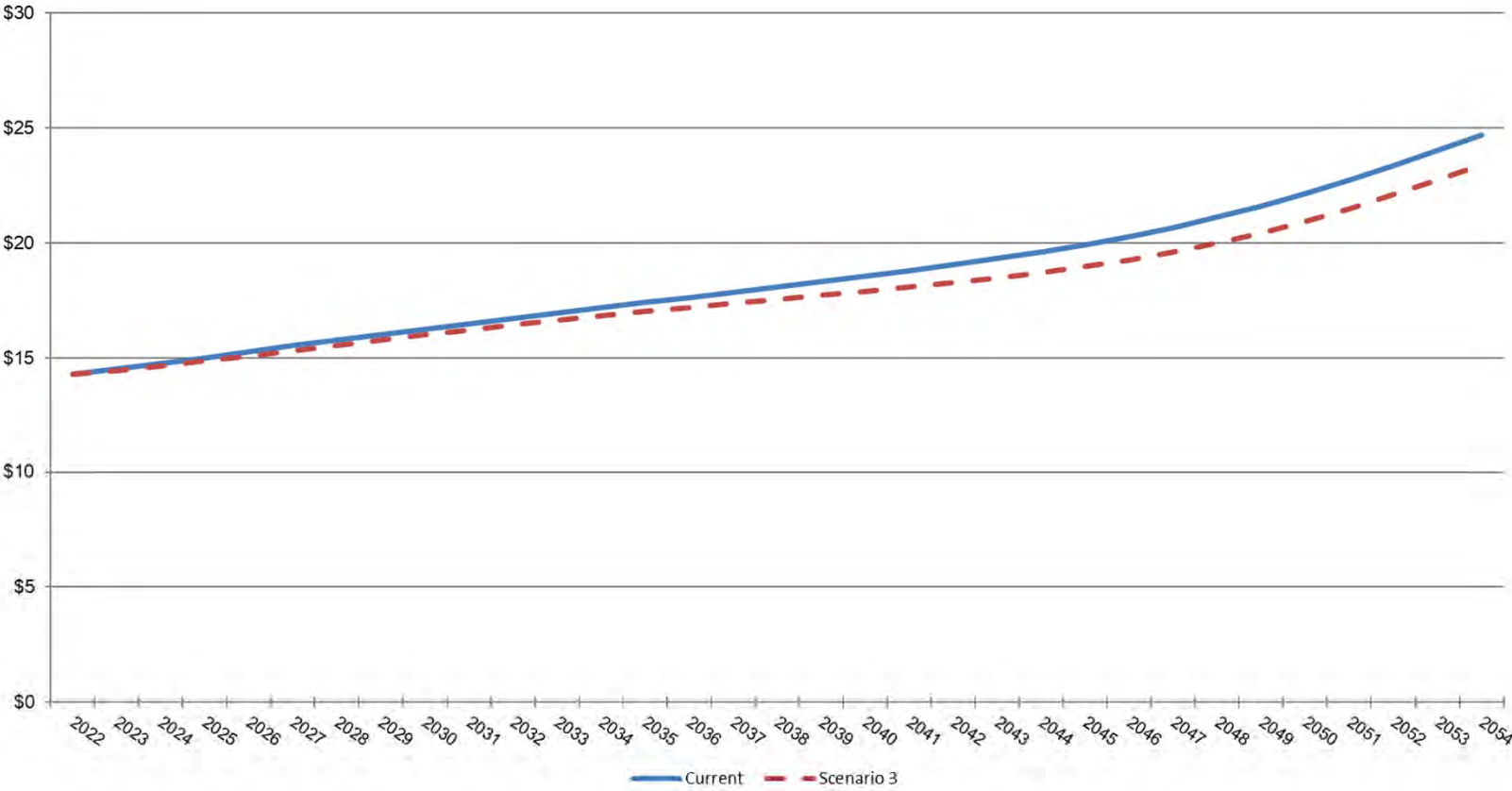
**Scenario 3 Assumptions - Comparison of Projected System Employer Contribution Amounts (Millions)**  
 Revised Demographic, 5.0% Average Salary Increase and 7.00% Interest Rate Assumption (Effective June 30, 2021 Valuation)



**Scenario 3 Assumptions - Comparison of Projected System Employer Contribution Rates**  
 Revised Demographic, 5.0% Average Salary Increase and 7.00% Interest Rate Assumption (Effective June 30, 2021 Valuation)

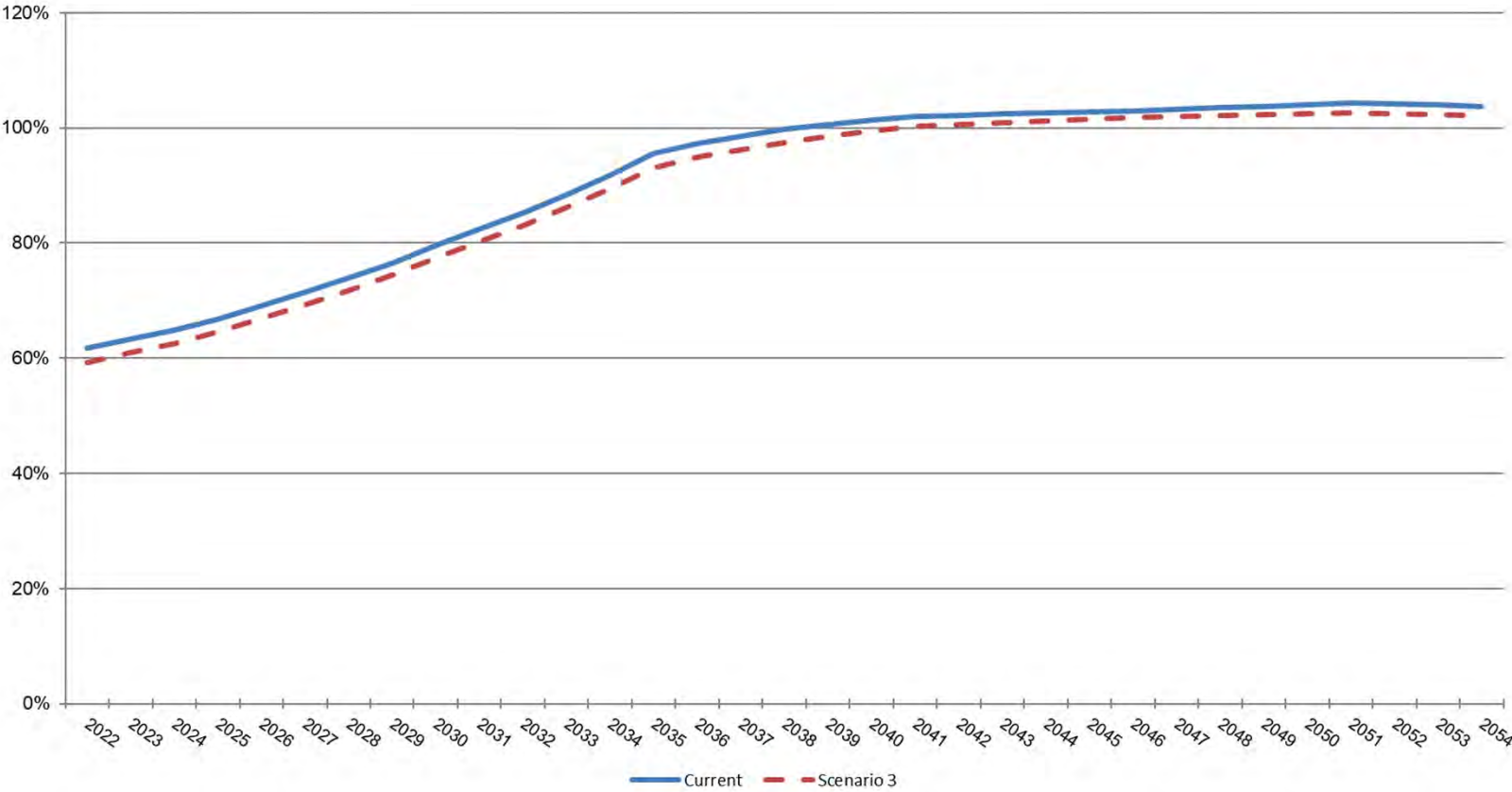


**Scenario 3 Assumptions - Comparison of Projected System Appropriation Payroll (Billions)**  
 Revised Demographic, 5.0% Average Salary Increase and 7.00% Interest Rate Assumption (Effective June 30, 2021 Valuation)



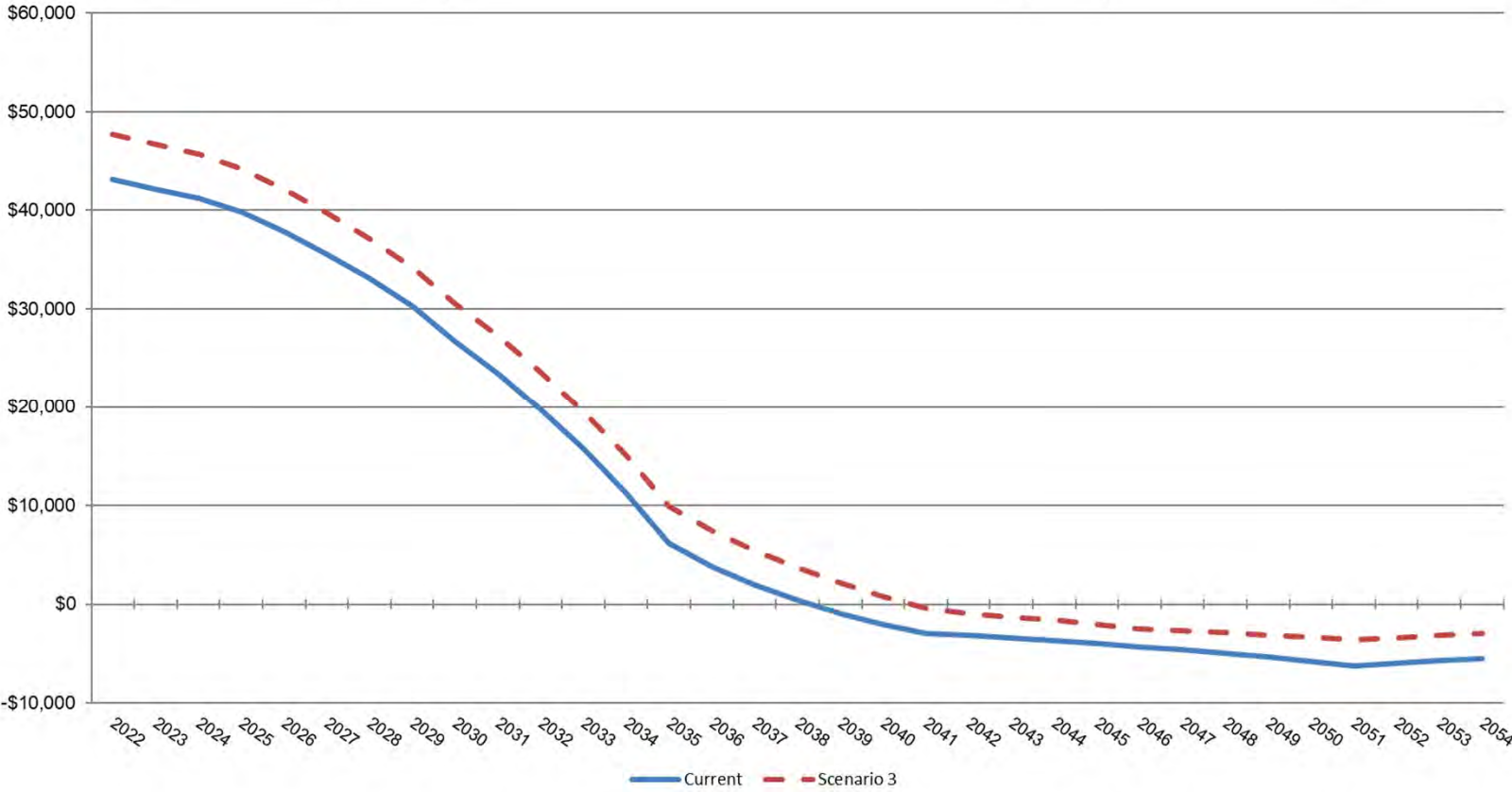
Note: Current assumes a 3.50% annual payroll growth while Scenario 3 assumes a 3.25% annual payroll growth.

**Scenario 3 Assumptions - Comparison of Projected System Funded Ratio (Actuarial Value of Assets)**  
 Revised Demographic, 5.0% Average Salary Increase and 7.00% Interest Rate Assumption (Effective June 30, 2021 Valuation)



# Scenario 3 Assumptions - Comparison of Projected System Unfunded Accrued Liability (Actuarial Value of Assets and in Millions)

Revised Demographic. 5.0% Average Salary Increase and 7.00% Interest Rate Assumption (Effective June 30, 2021 Valuation)



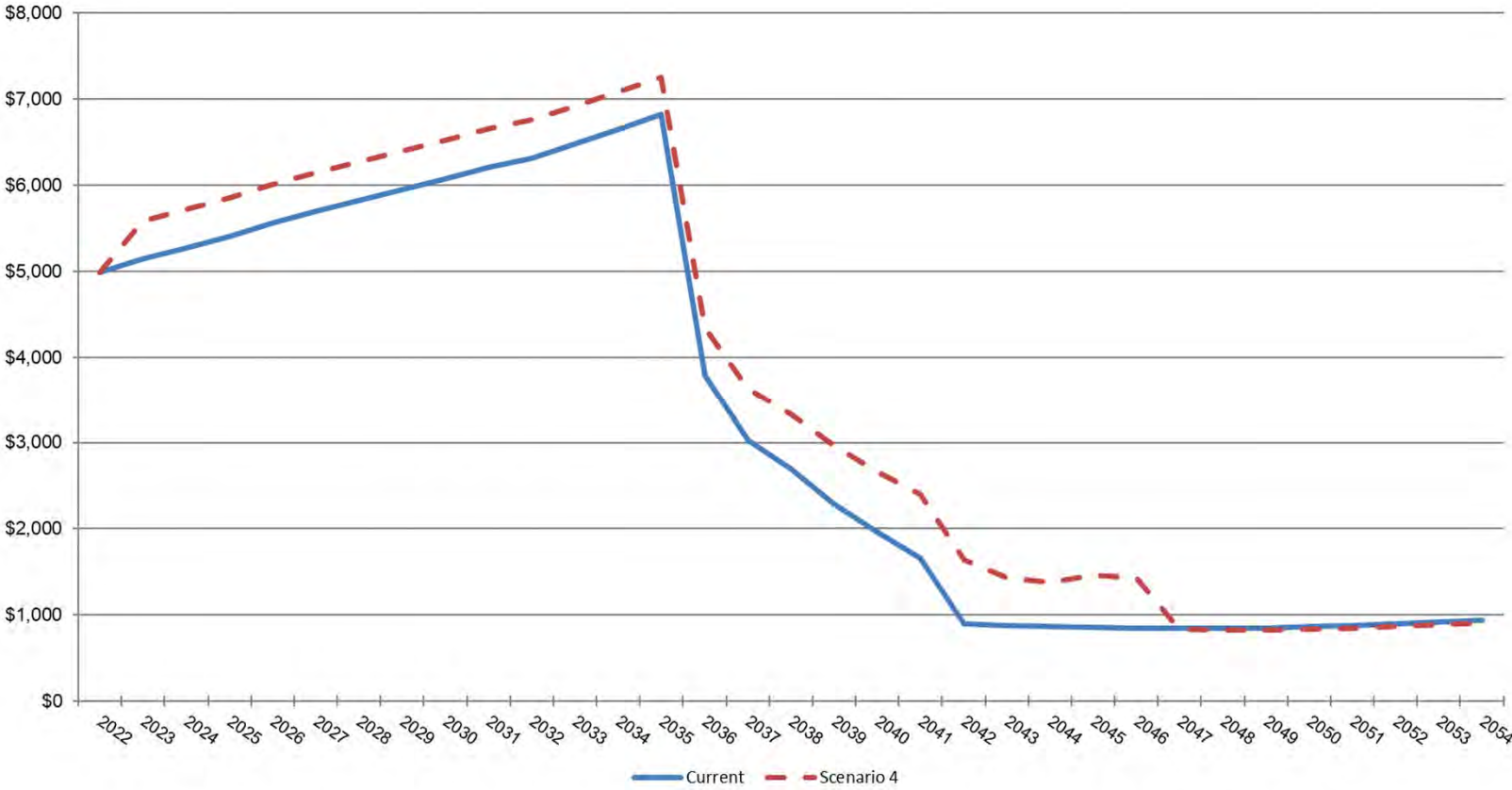
## Scenario 4 Assumptions - Projection of Contribution Rates and Funded Ratios As of June 30, 2020

### Revised Demographic, 5.0% Average Salary Increase and 6.875% Interest Rate Assumption (Effective June 30, 2021 Valuation)

Fiscal Year Ending June 30	Appropriation Payroll (\$Thousands)	DC Payroll (\$Thousands)			Fiscal Year Market Rate of Return	Member Contribution Rate	Employer Normal Cost	Employer Unfunded Liability Rate	Preliminary Employer Pension Rate	Health Care Contribution	Employer DC Contribution Rate			Total Employer Contribution Rate	Projected Total Employer Contribution (\$Thousands)	Funded Ratio	Unfunded Accrued Liability (Based on Actuarial Value of Assets & \$Millions)
		Class TG	Class TH	Class DC Only Participants							Class T-G 2.25% DC	Class T-H 2.00% DC	DC Only Participants 2.00% DC				
2019	\$ 13,775,000					7.57 %	7.59 %	25.01 %	32.60 %	0.83 %			33.43 %		58.1 %	\$ 44,134.2	
2020	13,880,000	\$ 389,350	\$ 179,700	\$ 29,950		7.59	7.49	25.87	33.36	0.84			34.29		59.2	44,034.5	
2021	14,078,000	720,583	332,577	55,429	20.00 %	7.61	7.37	26.14	33.51	0.82	0.12	0.05	0.01	34.51	\$ 4,858,318	57.3	49,636.0
<b>2022</b>	<b>14,289,000</b>	937,344	8,423	7,440	6.875	<b>7.56</b>	<b>7.20</b>	<b>26.79</b>	<b>33.99</b>	<b>0.80</b>	0.15	0.00	0.00	<b>34.94</b>	<b>4,992,577</b>	58.5	49,333.6
2023	14,437,216	1,455,300	13,816	12,875	6.875	7.48	7.58	30.07	37.65	0.81	0.23	0.00	0.00	38.69	5,585,759	60.2	48,288.0
2024	14,642,501	1,972,822	19,186	18,299	6.875	7.39	7.36	30.58	37.94	0.82	0.30	0.00	0.00	39.06	5,719,286	61.8	47,300.7
2025	14,858,226	2,478,077	24,421	23,584	6.875	7.32	7.13	31.07	38.20	0.81	0.38	0.00	0.00	39.39	5,852,480	63.7	45,793.4
2026	15,083,508	2,975,173	29,564	28,778	6.875	7.24	6.91	31.68	38.59	0.81	0.44	0.00	0.00	39.84	6,008,660	66.1	43,647.2
2027	15,312,426	3,475,096	34,725	33,989	6.875	7.17	6.69	32.16	38.85	0.79	0.51	0.00	0.00	40.15	6,148,493	68.5	41,276.9
2028	15,542,214	3,967,113	39,799	39,114	6.875	7.10	6.46	32.49	38.95	0.79	0.57	0.01	0.01	40.33	6,268,177	71.0	38,660.5
2029	15,769,628	4,458,141	44,862	44,223	6.875	7.04	6.23	32.87	39.10	0.78	0.64	0.01	0.01	40.54	6,392,640	73.6	35,697.4
2030	15,996,920	4,946,450	49,893	49,299	6.875	6.98	6.00	33.30	39.30	0.76	0.70	0.01	0.01	40.78	6,522,953	76.7	32,040.7
2031	16,220,458	5,448,633	55,018	54,400	6.875	6.92	5.76	33.72	39.48	0.76	0.76	0.01	0.01	41.02	6,653,742	79.4	28,689.2
2032	16,437,422	5,960,634	60,246	59,585	6.875	6.86	5.52	34.03	39.55	0.75	0.82	0.01	0.01	41.14	6,762,241	82.3	24,998.5
2033	16,641,284	6,479,672	65,545	64,838	6.875	6.80	5.28	34.67	39.95	0.75	0.88	0.01	0.01	41.60	6,922,844	85.4	20,894.3
2034	16,831,582	7,009,360	70,953	70,204	6.875	6.74	5.03	35.36	40.39	0.75	0.94	0.01	0.01	42.10	7,086,853	88.7	16,342.8
2035	17,014,355	7,553,705	76,509	75,721	6.875	6.68	4.77	36.10	40.87	0.75	1.00	0.01	0.01	42.64	7,254,993	92.2	11,309.0
2036	17,194,562	8,114,515	82,231	81,410	6.875	6.62	4.51	36.93	41.44	0.75	1.06	0.01	0.01	43.20	7,434,906	94.0	8,838.3
2037	17,371,506	8,690,958	88,110	87,255	6.875	6.55	4.24	37.77	42.11	0.75	1.13	0.01	0.01	43.80	7,624,979	95.3	6,907.2
2038	17,548,738	9,283,573	94,154	93,271	6.875	6.48	3.97	38.61	42.82	0.75	1.19	0.01	0.01	44.40	7,824,112	96.5	5,142.0
2039	17,724,984	9,893,397	100,370	99,464	6.875	6.41	3.69	39.45	43.53	0.75	1.26	0.01	0.01	45.00	8,028,245	97.6	3,610.2
2040	17,904,372	10,519,894	106,752	105,824	6.875	6.34	3.41	40.28	44.26	0.75	1.32	0.01	0.01	45.60	8,236,378	98.5	2,252.1
2041	18,088,641	11,163,062	113,300	112,360	6.875	6.26	3.14	41.11	45.00	0.75	1.39	0.01	0.01	46.20	8,448,511	99.3	1,046.3
2042	18,281,943	11,821,690	120,009	119,057	6.875	6.19	2.86	41.94	45.74	0.75	1.45	0.01	0.01	46.80	8,662,644	99.7	497.5
2043	18,489,936	12,496,133	126,880	125,927	6.875	6.11	2.60	42.77	46.48	0.75	1.52	0.01	0.01	47.40	8,878,777	99.9	105.7
2044	18,719,946	13,184,034	133,888	132,937	6.875	6.04	2.34	43.60	47.22	0.75	1.58	0.01	0.01	48.00	9,094,910	100.2	(275.7)
2045	18,979,162	13,883,386	141,017	140,068	6.875	5.97	2.10	44.42	47.96	0.75	1.65	0.01	0.01	48.60	9,311,043	100.5	(777.2)
2046	19,273,376	14,588,890	148,186	147,302	6.875	5.90	1.89	45.24	48.69	0.75	1.70	0.02	0.02	49.20	9,527,176	100.9	(1,289.1)
2047	19,611,806	15,303,580	155,454	154,629	6.875	5.83	1.71	(1.47)	49.41	0.75	1.76	0.02	0.02	49.80	9,743,309	100.9	(1,250.7)
2048	19,998,520	16,024,107	162,758	162,016	6.875	5.77	1.56	(1.39)	50.14	0.75	1.80	0.02	0.02	50.40	9,959,442	100.8	(1,199.7)
2049	20,444,160	16,756,714	170,201	169,533	6.875	5.72	1.43	(1.39)	50.87	0.75	1.84	0.02	0.02	50.70	10,175,575	100.8	(1,137.8)
2050	20,946,370	17,503,221	177,784	177,196	6.875	5.68	1.33	(1.57)	51.60	0.75	1.88	0.02	0.02	51.00	10,391,708	100.8	(1,065.7)
2051	21,497,798	18,265,368	185,542	185,026	6.875	5.63	1.26	(1.55)	52.33	0.75	1.91	0.02	0.02	51.30	10,607,841	100.7	(985.5)
2052	22,096,371	19,048,500	193,512	193,085	6.875	5.60	1.20	(1.27)	53.06	0.75	1.94	0.02	0.02	51.60	10,823,974	100.4	(600.9)
2053	22,737,775	19,841,526	201,603	201,241	6.875	5.57	1.15	(1.04)	53.79	0.75	1.96	0.02	0.02	51.90	11,040,107	100.2	(227.3)
2054	23,412,392	20,636,093	209,721	209,433	6.875	5.55	1.11	(0.76)	54.52	0.75	1.98	0.02	0.02	52.20	11,256,240	99.9	115.0
<b>Total</b>														<b>126,566,849</b>			

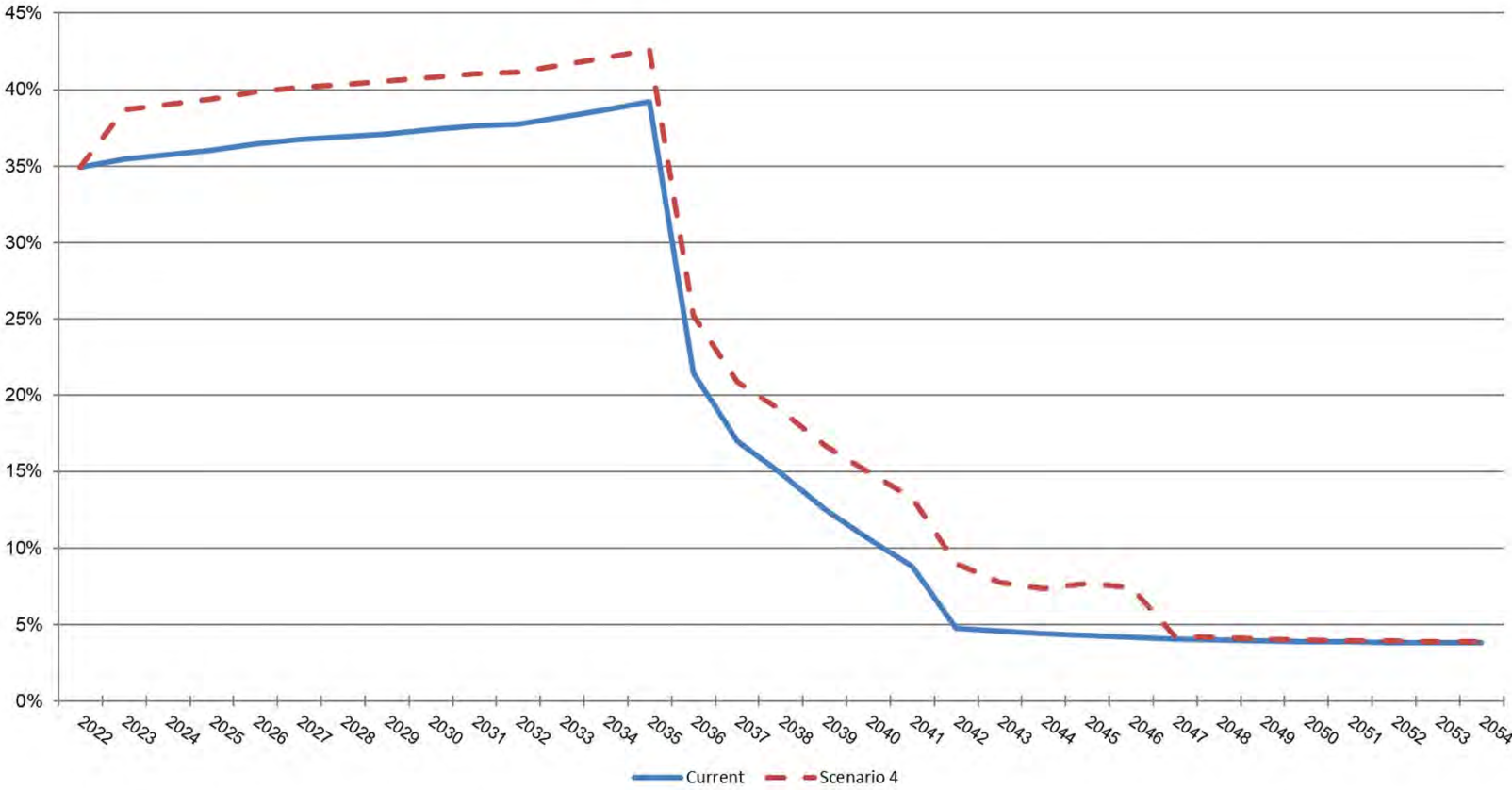
Note: Assumes an investment return of 20.00% for fiscal year ending 6/30/2021 and 6.875% per year thereafter.

**Scenario 4 Assumptions - Comparison of Projected System Employer Contribution Amounts (Millions)**  
 Revised Demographic, 5.0% Average Salary Increase and 6.875% Interest Rate Assumption (Effective June 30, 2021 Valuation)

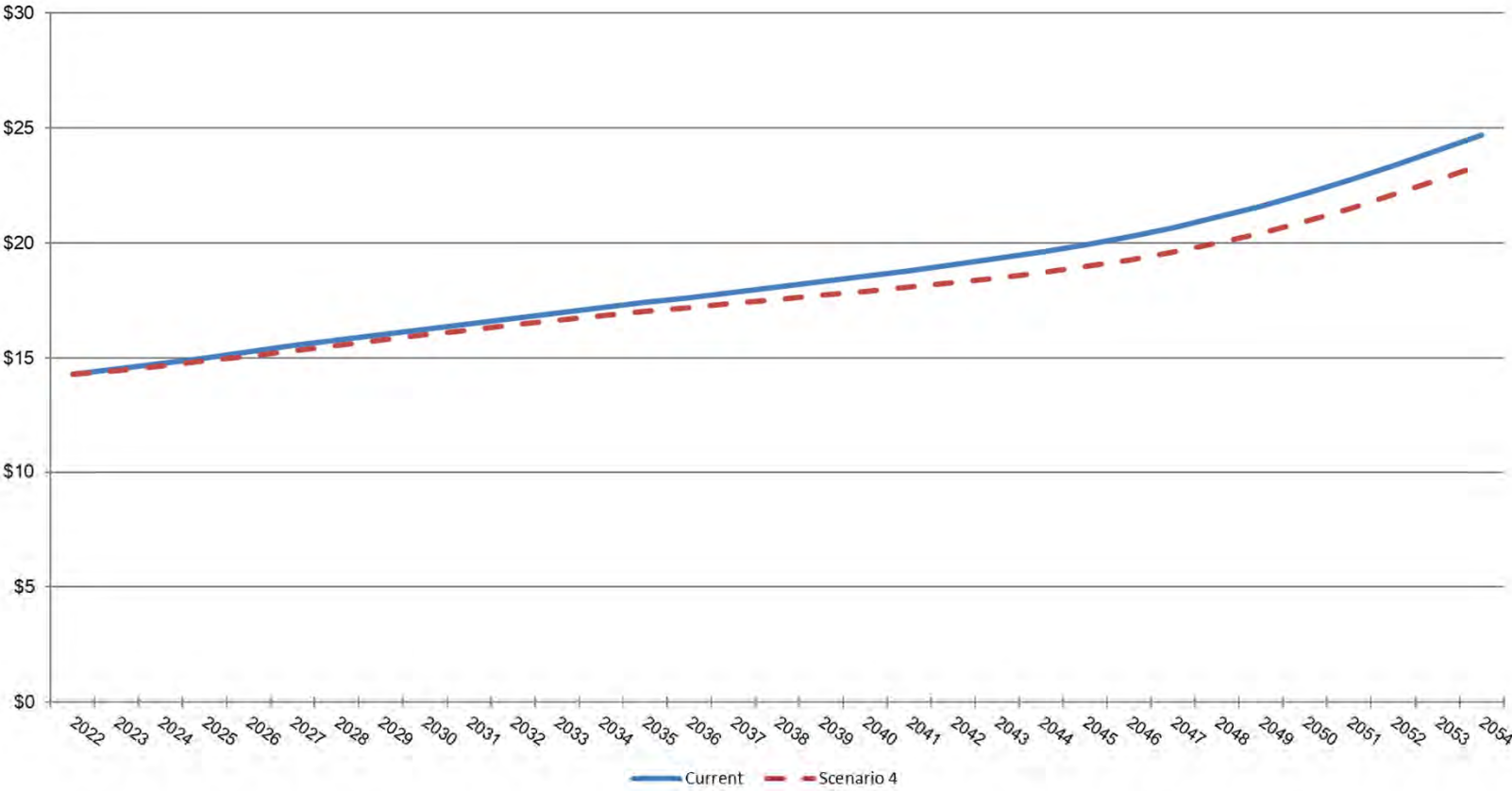




**Scenario 4 Assumptions - Comparison of Projected System Employer Contribution Rates**  
 Revised Demographic, 5.0% Average Salary Increase and 6.875% Interest Rate Assumption (Effective June 30, 2021 Valuation)

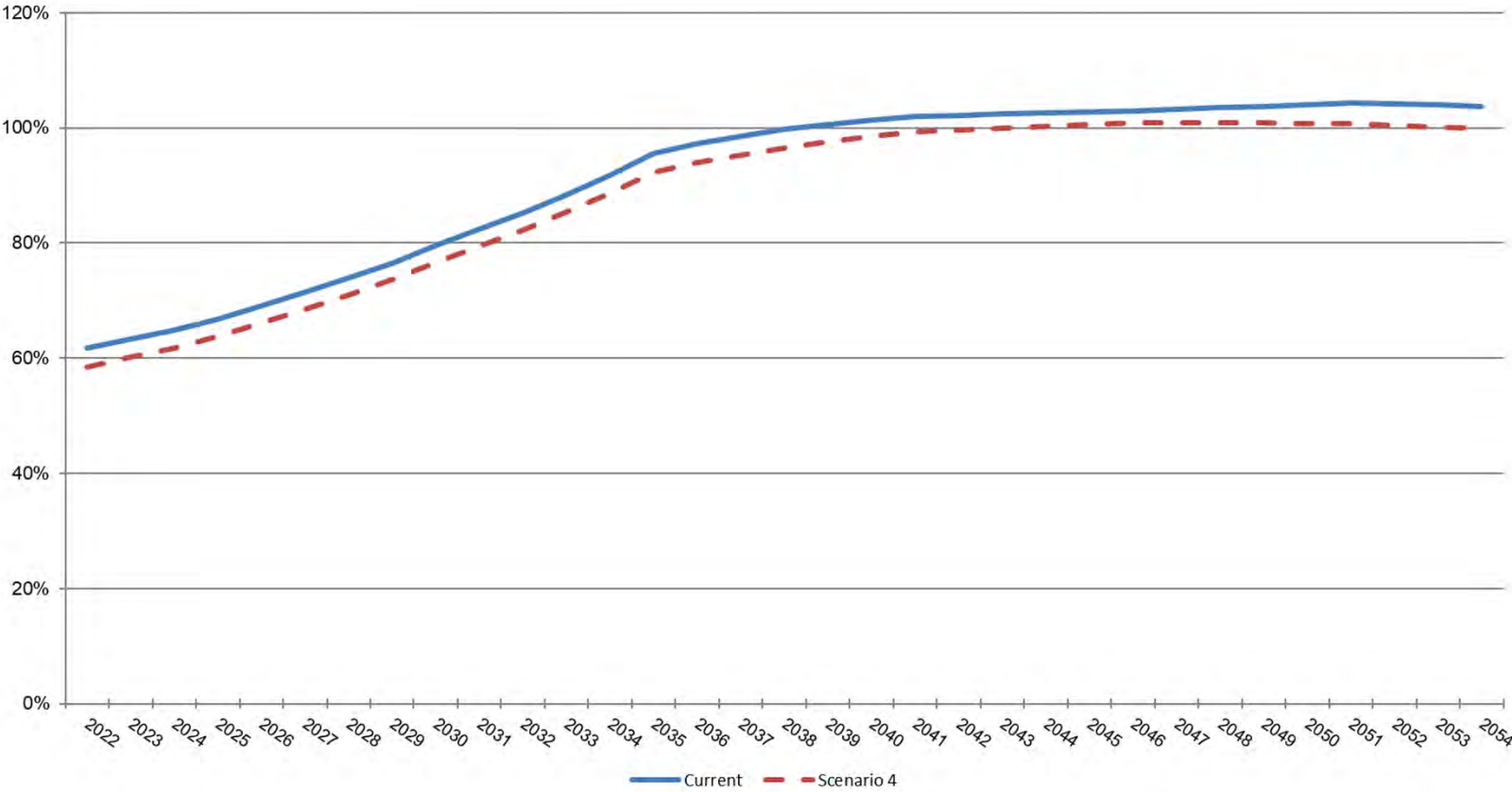


**Scenario 4 Assumptions - Comparison of Projected System Appropriation Payroll (Billions)**  
 Revised Demographic, 5.0% Average Salary Increase and 6.875% Interest Rate Assumption (Effective June 30, 2021 Valuation)



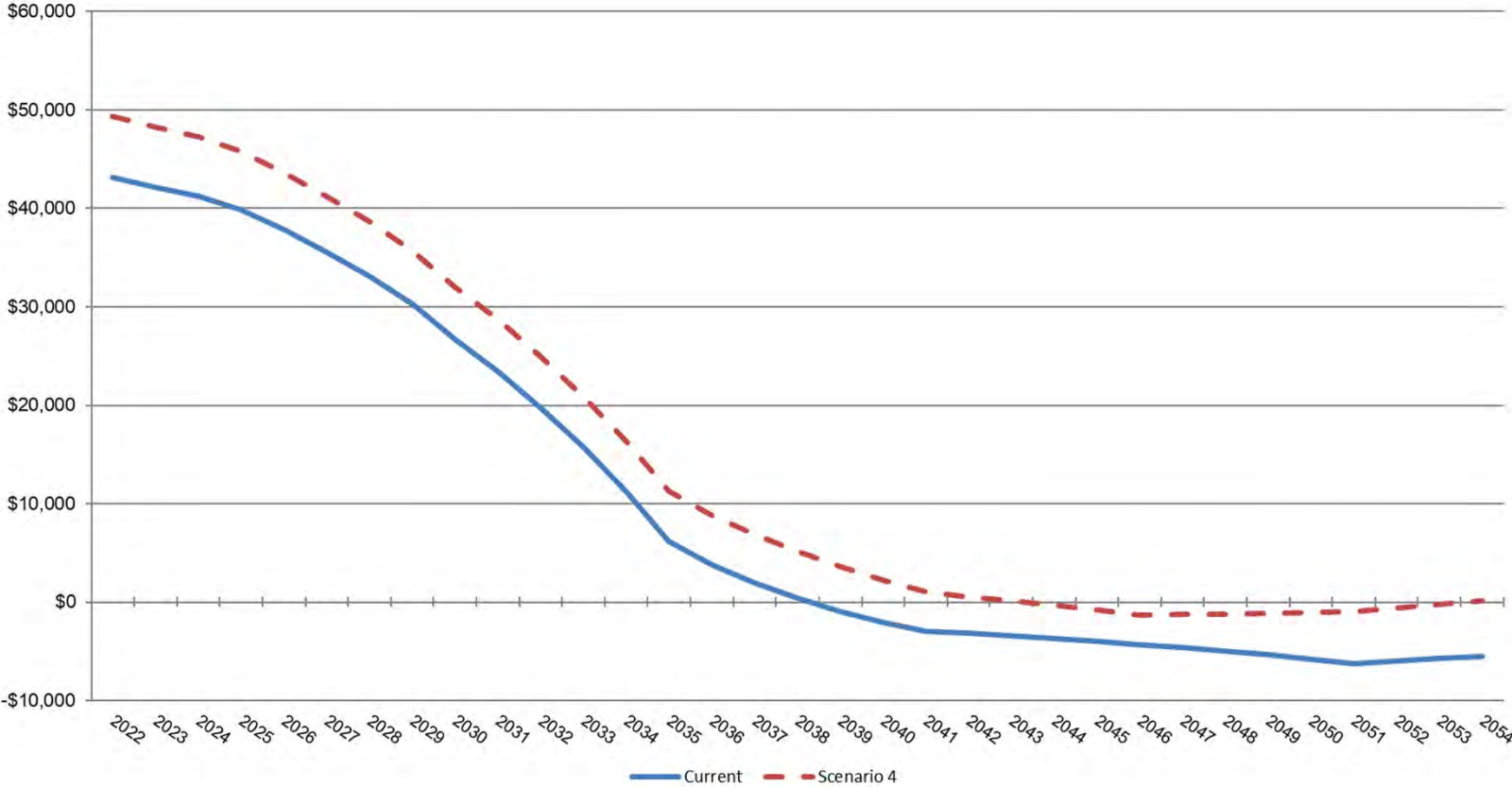
Note: Current assumes a 3.50% annual payroll growth while Scenario 4 assumes a 3.25% annual payroll growth

**Scenario 4 Assumptions - Comparison of Projected System Funded Ratio (Actuarial Value of Assets)**  
 Revised Demographic, 5.0% Average Salary Increase and 6.875% Interest Rate Assumption (Effective June 30, 2021 Valuation)



# Scenario 4 Assumptions - Comparison of Projected System Unfunded Accrued Liability (Actuarial Value of Assets and in Millions)

Revised Demographic, 5.0% Average Salary Increase and 6.875% Interest Rate Assumption (Effective June 30, 2021 Valuation)



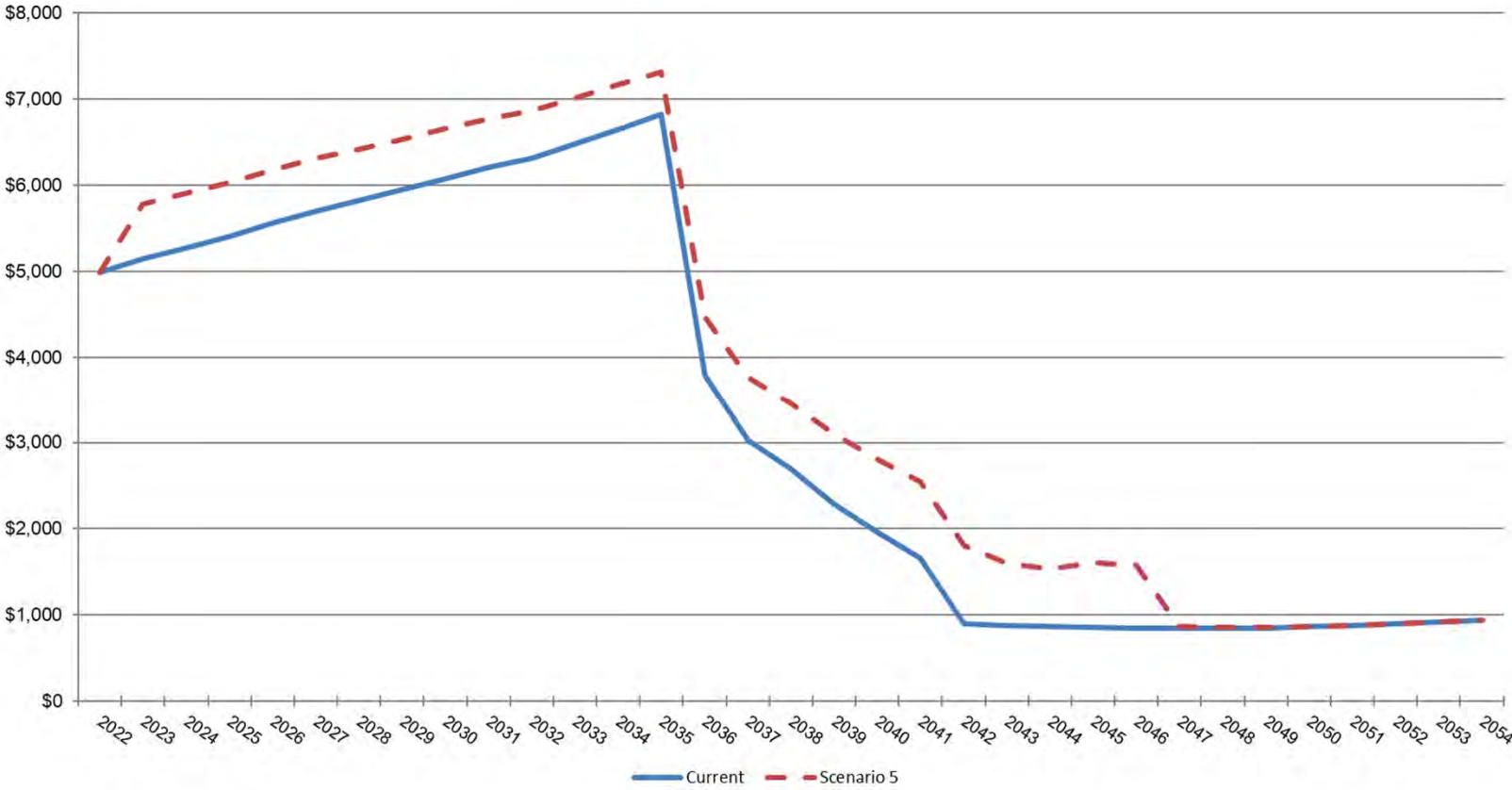
## Scenario 5 Assumptions - Projection of Contribution Rates and Funded Ratios As of June 30, 2020

Revised Demographic, 5.0% Average Salary Increase and 6.75% Interest Rate Assumption (Effective June 30, 2021 Valuation)

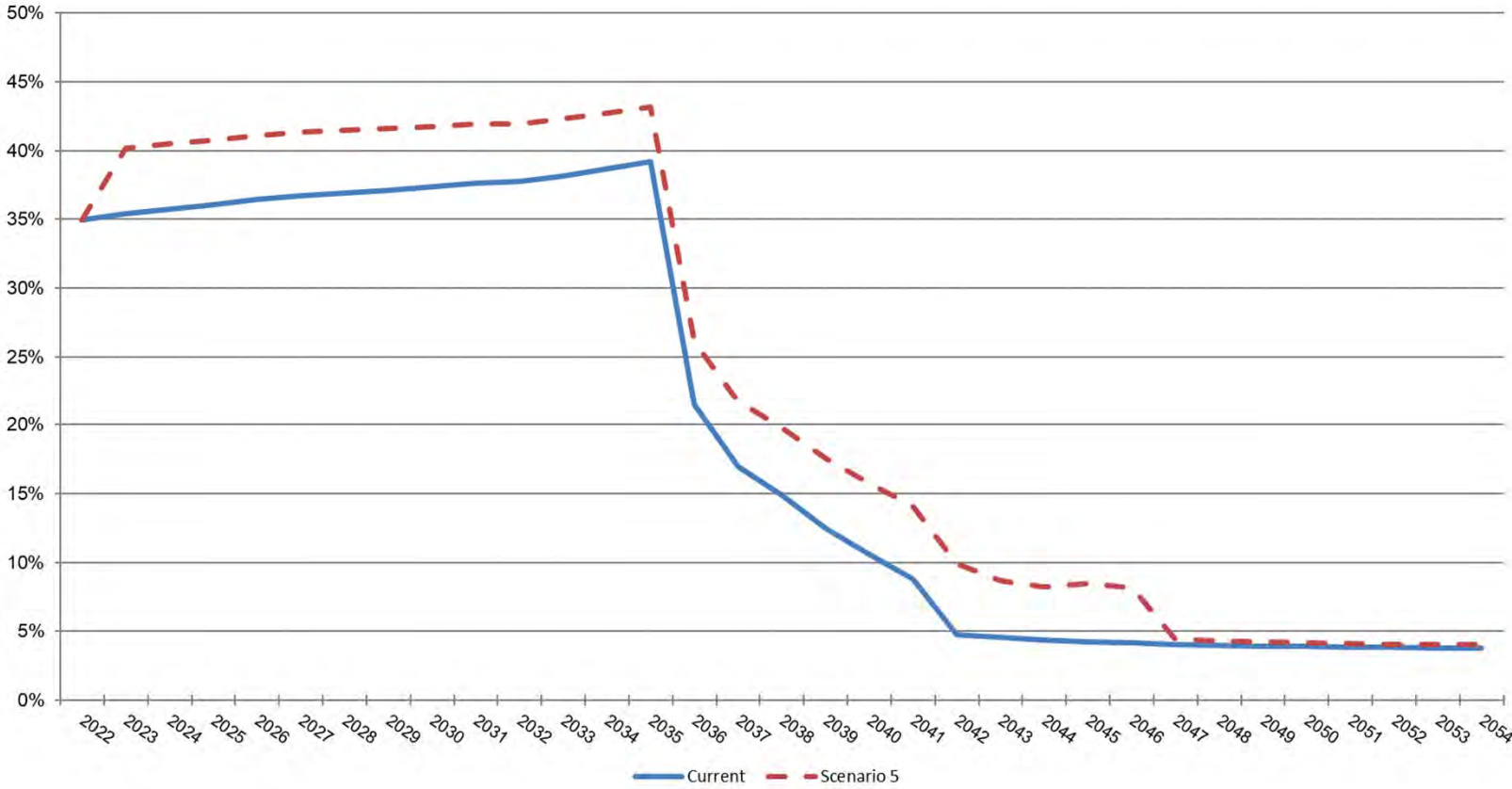
Fiscal Year Ending June 30	Appropriation Payroll (\$Thousands)	DC Payroll (\$Thousands)			Fiscal Year Market Rate of Return	Member Contribution Rate	Employer Normal Cost	Employer Unfunded Liability Rate	Preliminary Employer Pension Rate	Health Care Contribution	Employer DC Contribution Rate			Total Employer Contribution Rate	Projected Total Employer Contribution (\$Thousands)	Funded Ratio	Unfunded Accrued Liability (Based on Actuarial Value of Assets & \$Millions)
		Class TG	Class TH	Class DC Only Participants							Class T-G 2.25% DC	Class T-H 2.00% DC	DC Only Participants 2.00% DC				
2019	\$ 13,775,000					7.57 %	7.59 %	25.01 %	32.60 %	0.83 %				33.43 %		58.1 %	\$ 44,134.2
2020	13,880,000	\$ 389,350	\$ 179,700	\$ 29,950		7.59	7.49	25.87	33.36	0.84	0.06 %	0.03 %	0.00 %	34.29		<b>59.2</b>	<b>44,034.5</b>
2021	14,078,000	720,583	332,577	55,429	20.00 %	7.61	7.37	26.14	33.51	0.82	0.12	0.05	0.01	34.51	\$ 4,858,318	56.5	51,178.6
<b>2022</b>	<b>14,289,000</b>	937,344	8,423	7,440	6.750	<b>7.56</b>	<b>7.20</b>	<b>26.79</b>	<b>33.99</b>	<b>0.80</b>	0.15	0.00	0.00	<b>34.94</b>	<b>4,992,577</b>	57.6	50,972.9
2023	14,384,812	1,450,018	13,766	12,828	6.750	7.48	7.99	31.13	39.12	0.82	0.23	0.00	0.00	40.17	5,778,379	59.4	49,839.4
2024	14,589,352	1,965,661	19,116	18,232	6.750	7.39	7.77	31.59	39.36	0.82	0.30	0.00	0.00	40.48	5,905,292	61.1	48,766.6
2025	14,804,294	2,469,082	24,333	23,499	6.750	7.32	7.53	32.02	39.55	0.81	0.38	0.00	0.00	40.74	6,030,601	63.1	47,176.9
2026	15,028,759	2,964,374	29,456	28,673	6.750	7.24	7.31	32.56	39.87	0.81	0.44	0.00	0.00	41.12	6,180,035	65.5	44,952.7
2027	15,256,846	3,462,482	34,599	33,866	6.750	7.17	7.08	32.98	40.06	0.79	0.51	0.00	0.00	41.36	6,310,811	67.9	42,510.7
2028	15,485,800	3,952,713	39,655	38,972	6.750	7.10	6.84	33.24	40.08	0.79	0.57	0.01	0.01	41.46	6,420,518	70.5	39,830.4
2029	15,712,388	4,441,959	44,699	44,063	6.750	7.04	6.60	33.55	40.15	0.79	0.64	0.01	0.01	41.60	6,536,015	73.1	36,812.5
2030	15,938,855	4,928,495	49,712	49,120	6.750	6.98	6.36	33.90	40.26	0.77	0.70	0.01	0.01	41.75	6,655,233	76.2	33,111.7
2031	16,161,582	5,428,856	54,818	54,203	6.750	6.92	6.11	34.26	40.37	0.77	0.76	0.01	0.01	41.92	6,774,170	78.9	29,729.0
2032	16,377,758	5,938,999	60,027	59,369	6.750	6.86	5.86	34.49	40.35	0.76	0.82	0.01	0.01	41.95	6,869,846	81.8	26,021.0
2033	16,580,880	6,456,152	65,308	64,602	6.750	6.80	5.61	35.05	40.66	0.76	0.88	0.01	0.01	42.32	7,017,365	84.8	21,915.2
2034	16,770,487	6,983,917	70,696	69,949	6.750	6.74	5.35	35.67	41.02	0.76	0.94	0.01	0.01	42.74	7,167,412	88.1	17,379.7
2035	16,952,597	7,526,287	76,231	75,446	6.750	6.68	5.08	36.32	41.40	0.76	1.00	0.01	0.01	43.18	7,320,695	91.6	12,318.5
2036	17,132,150	8,085,062	81,933	81,115	6.750	6.62	4.81	37.00	41.74	0.76	1.06	0.01	0.01	43.66	7,482,978	94.9	9,756.1
2037	17,308,451	8,659,412	87,790	86,939	6.750	6.55	4.53	37.73	42.03	0.76	1.13	0.01	0.01	44.19	7,648,266	98.4	7,713.3
2038	17,485,041	9,249,876	93,812	92,932	6.750	6.48	4.24	38.47	42.28	0.76	1.19	0.01	0.01	44.72	7,822,565	101.9	5,823.7
2039	17,660,646	9,857,486	100,006	99,103	6.750	6.41	3.96	39.21	42.50	0.76	1.26	0.01	0.01	45.24	8,006,864	105.4	4,150.8
2040	17,839,383	10,481,709	106,364	105,440	6.750	6.34	3.66	39.94	42.69	0.76	1.32	0.01	0.01	45.76	8,198,163	108.8	2,635.0
2041	18,022,983	11,122,543	112,889	111,952	6.750	6.26	3.38	40.67	42.84	0.76	1.39	0.01	0.01	46.26	8,397,462	112.2	1,253.4
2042	18,215,584	11,778,780	119,573	118,625	6.750	6.19	3.08	41.47	42.97	0.76	1.45	0.01	0.01	46.76	8,602,761	115.5	490.8
2043	18,422,822	12,450,775	126,419	125,470	6.750	6.11	2.81	42.26	43.06	0.76	1.52	0.01	0.01	47.23	8,814,060	118.7	(138.2)
2044	18,651,997	13,136,179	133,402	132,454	6.750	6.04	2.54	43.03	43.12	0.76	1.58	0.01	0.01	47.67	9,030,359	121.8	(776.1)
2045	18,910,272	13,832,992	140,505	139,560	6.750	5.97	2.29	43.78	43.18	0.76	1.65	0.01	0.01	48.08	9,251,658	124.8	(1,548.8)
2046	19,203,418	14,535,935	147,648	146,767	6.750	5.90	2.07	44.51	43.14	0.76	1.70	0.02	0.02	48.44	9,477,957	127.7	(2,351.9)
2047	19,540,620	15,248,031	154,890	154,068	6.750	5.83	1.88	(1.85)	0.03	0.76	1.76	0.02	0.02	48.74	9,709,256	130.5	(2,525.3)
2048	19,925,931	15,965,944	162,167	161,428	6.750	5.77	1.72	(1.83)	(0.11)	0.76	1.80	0.02	0.02	48.99	9,945,555	133.2	(2,707.3)
2049	20,369,952	16,695,891	169,583	168,918	6.750	5.72	1.59	(1.90)	(0.31)	0.76	1.84	0.02	0.02	49.20	10,185,854	135.8	(2,901.3)
2050	20,870,339	17,439,688	177,139	176,553	6.750	5.68	1.48	(2.15)	(0.67)	0.76	1.88	0.02	0.02	49.37	10,430,153	138.3	(3,109.4)
2051	21,419,766	18,199,069	184,869	184,354	6.750	5.63	1.41	(2.21)	(0.80)	0.76	1.91	0.02	0.02	49.50	10,682,452	140.7	(3,335.3)
2052	22,016,166	18,979,358	192,810	192,384	6.750	5.60	1.34	(2.04)	(0.70)	0.76	1.94	0.02	0.02	49.59	10,942,751	142.9	(3,111.3)
2053	22,655,243	19,769,507	200,871	200,510	6.750	5.57	1.29	(1.91)	(0.62)	0.76	1.96	0.02	0.02	49.64	11,209,050	144.9	(2,887.2)
2054	23,327,411	20,561,189	208,960	208,673	6.750	5.55	1.25	(1.69)	(0.44)	0.76	1.98	0.02	0.02	49.67	11,480,349	146.7	(2,691.8)
<b>Total</b>														<b>130,171,052</b>			

Note: Assumes an investment return of 20.00% for fiscal year ending 6/30/2021 and 6.75% per year thereafter.

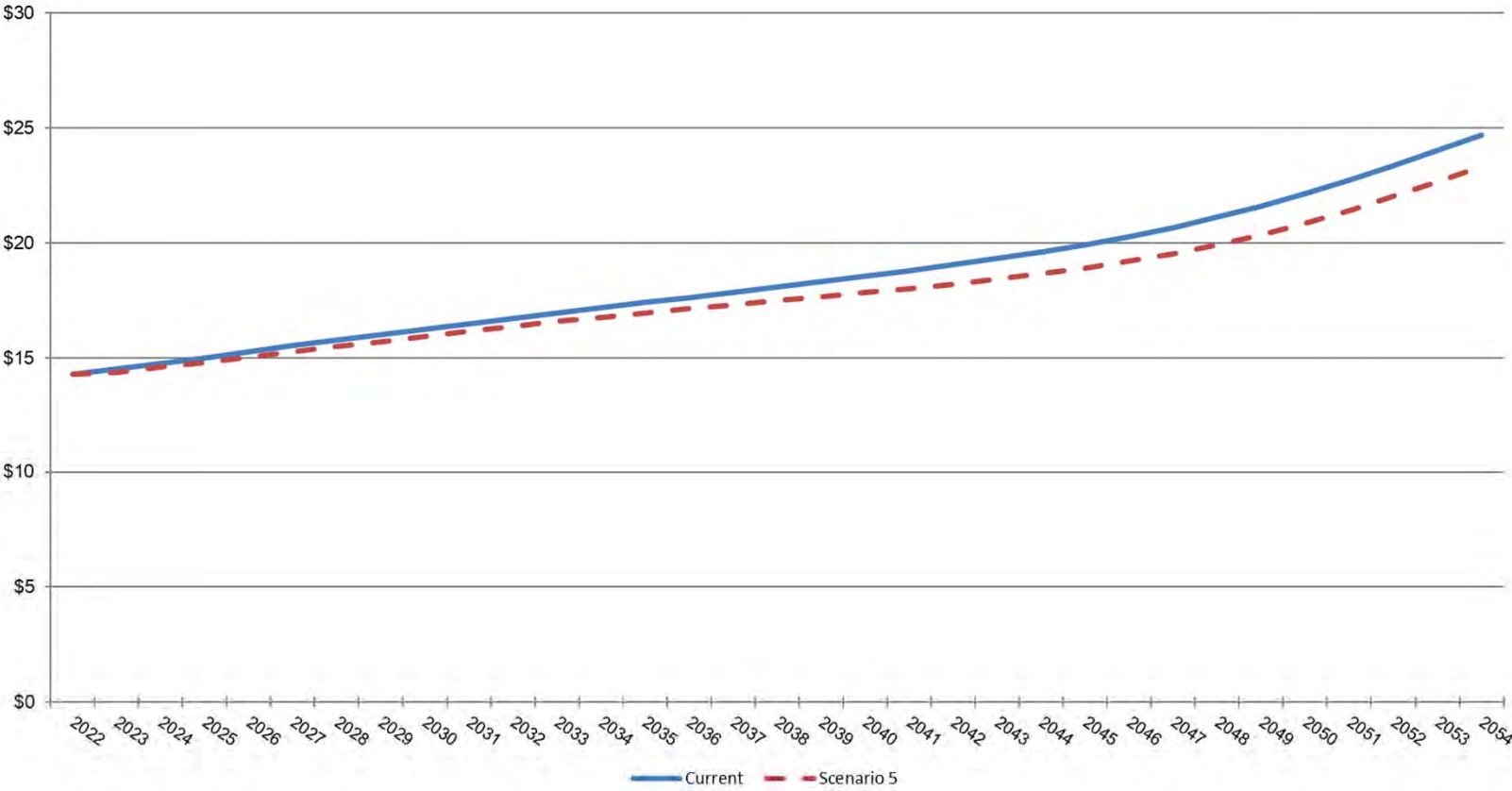
**Scenario 5 Assumptions - Comparison of Projected System Employer Contribution Amounts (Millions)**  
 Revised Demographic, 5.0% Average Salary Increase and 6.75% Interest Rate Assumption (Effective June 30, 2021 Valuation)



**Scenario 5 Assumptions - Comparison of Projected System Employer Contribution Rates**  
 Revised Demographic, 5.0% Average Salary Increase and 6.75% Interest Rate Assumption (Effective June 30, 2021 Valuation)



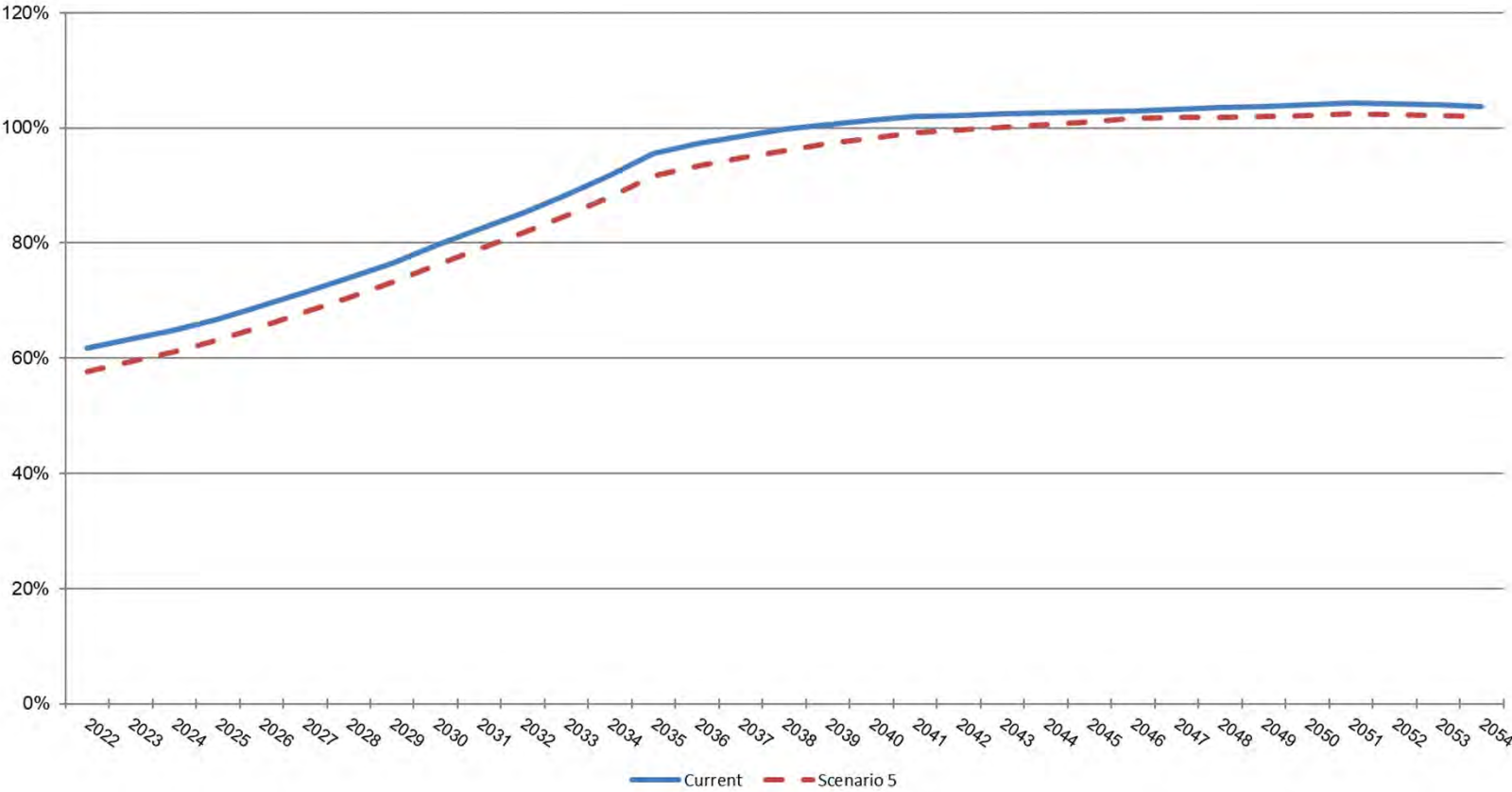
**Scenario 5 Assumptions - Comparison of Projected System Appropriation Payroll (Billions)**  
 Revised Demographic, 5.0% Average Salary Increase and 6.75% Interest Rate Assumption (Effective June 30, 2021 Valuation)



Note: Current assumes a 3.50% annual payroll growth while Scenario 5 assumes a 3.00% annual payroll growth.

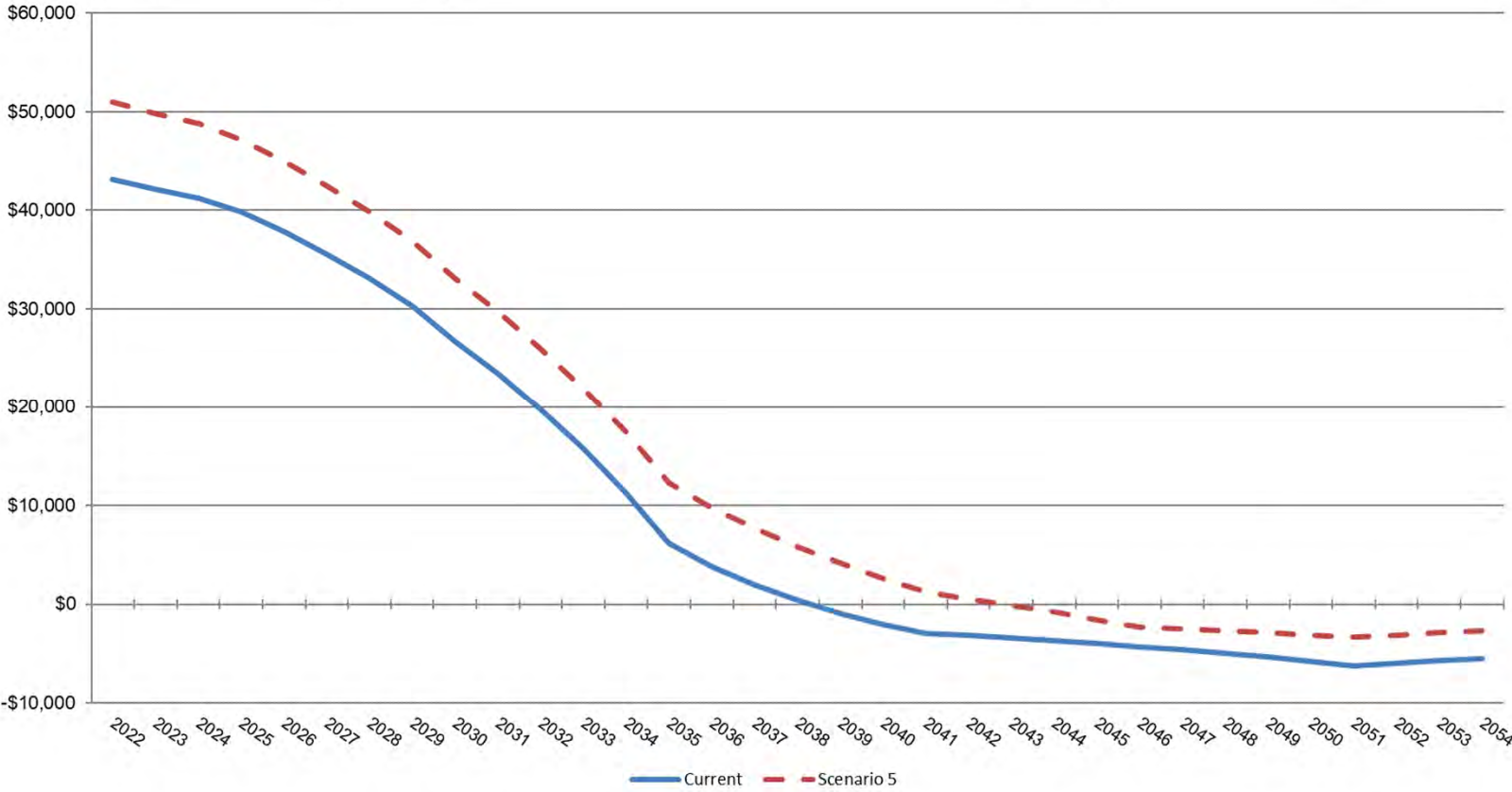


**Scenario 5 Assumptions - Comparison of Projected System Funded Ratio (Actuarial Value of Assets)**  
 Revised Demographic, 5.0% Average Salary Increase and 6.75% Interest Rate Assumption (Effective June 30, 2021 Valuation)



# Scenario 5 Assumptions - Comparison of Projected System Unfunded Accrued Liability (Actuarial Value of Assets and in Millions)

Revised Demographic. 5.0% Average Salary Increase and 6.75% Interest Rate Assumption (Effective June 30, 2021 Valuation)



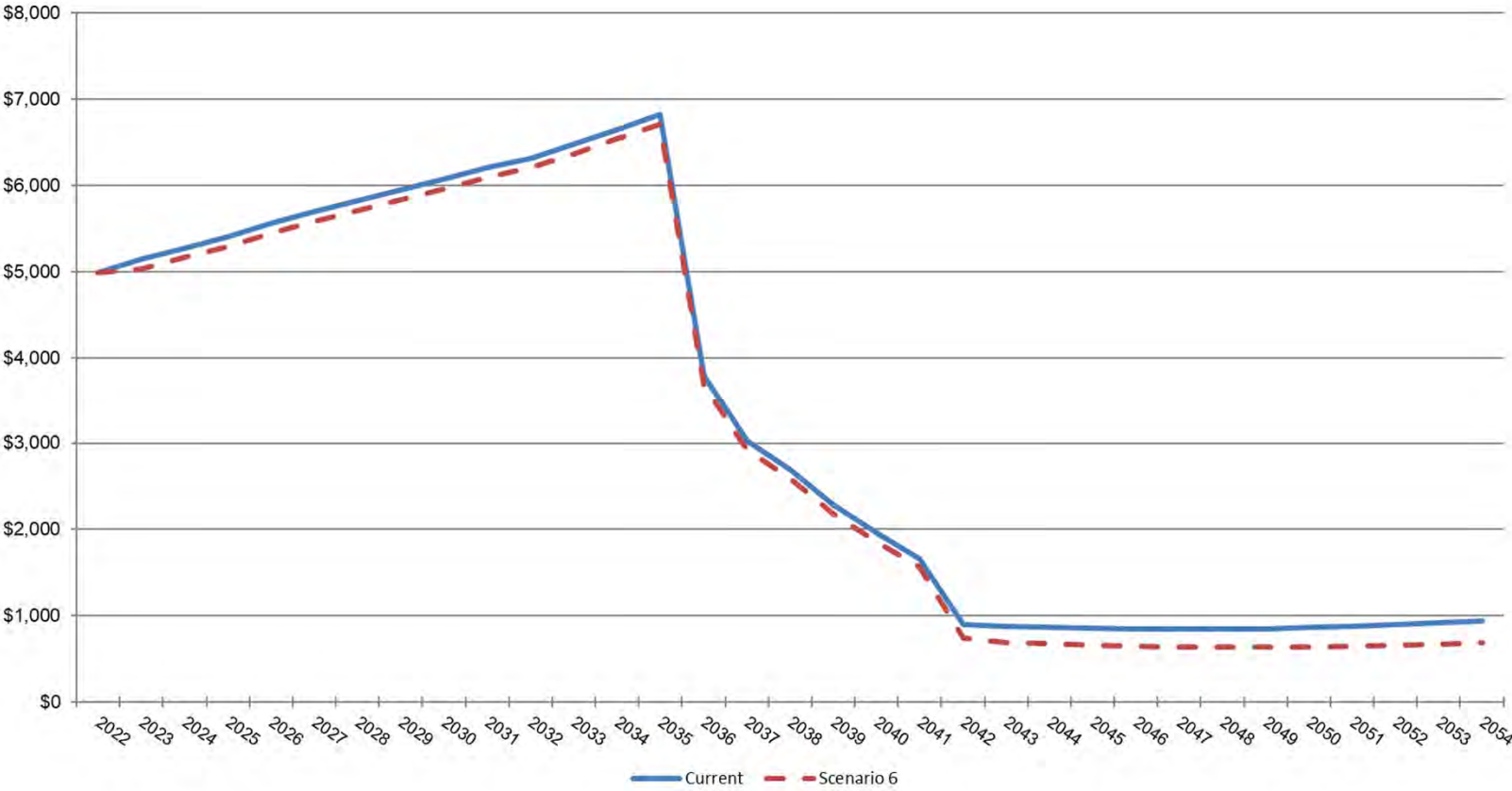
## Scenario 6 Assumptions - Projection of Contribution Rates and Funded Ratios As of June 30, 2020

### Revised Demographic, 4.75% Average Salary Increase and 7.25% Interest Rate Assumption (Effective June 30, 2021 Valuation)

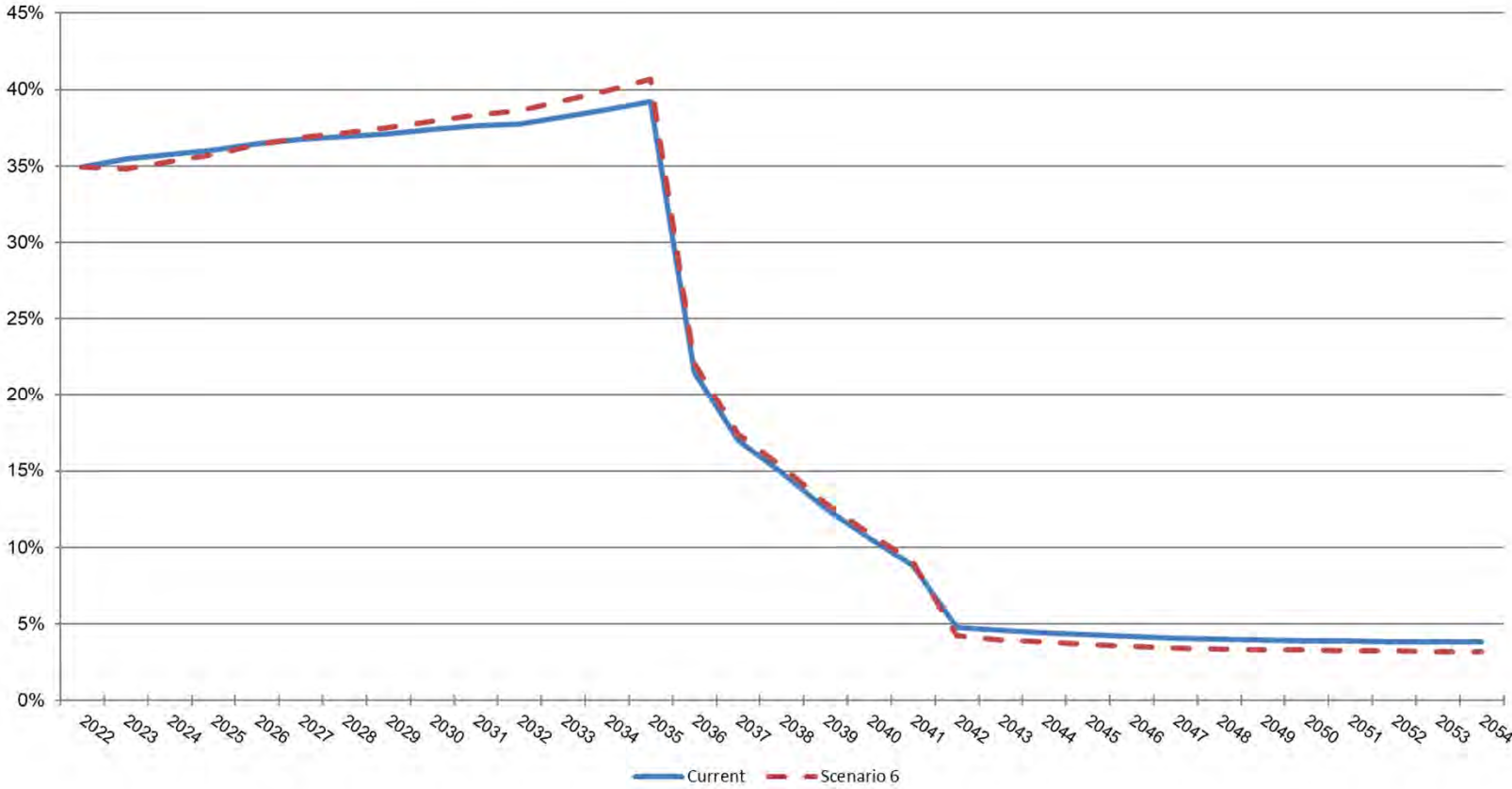
Fiscal Year Ending June 30	Appropriation Payroll (\$Thousands)	DC Payroll (\$Thousands)			Fiscal Year Market Rate of Return	Member Contribution Rate	Employer Normal Cost	Employer Unfunded Liability Rate	Preliminary Employer Pension Rate	Health Care Contribution	Employer DC Contribution Rate			Total Employer Contribution Rate	Projected Total Employer Contribution (\$Thousands)	Funded Ratio	Unfunded Accrued Liability (Based on Actuarial Value of Assets & \$Millions)
		Class TG	Class TH	Class DC Only Participants							Class T-G 2.25% DC	Class T-H 2.00% DC	DC Only Participants 2.00% DC				
2019	\$ 13,775,000					7.57 %	7.59 %	25.01 %	32.60 %	0.83 %				33.43 %		58.1 %	\$ 44,134.2
2020	13,880,000	\$ 389,350	\$ 179,700	\$ 29,950		7.59	7.49	25.87	33.36	0.84	0.06 %	0.03 %	0.00 %	34.29		<b>59.2</b>	<b>44,034.5</b>
2021	14,078,000	720,583	332,577	55,429	20.00 %	7.61	7.37	26.14	33.51	0.82	0.12	0.05	0.01	34.51	\$ 4,858,318	59.9	44,487.2
<b>2022</b>	<b>14,289,000</b>	937,344	8,423	7,440	7.250	<b>7.56</b>	<b>7.20</b>	<b>26.79</b>	<b>33.99</b>	<b>0.80</b>	0.15	0.00	0.00	<b>34.94</b>	<b>4,992,577</b>	61.4	43,833.6
2023	14,452,017	1,449,534	13,762	12,824	7.250	7.48	5.89	27.87	33.76	0.81	0.23	0.00	0.00	34.80	5,029,302	63.0	42,885.3
2024	14,619,441	1,955,000	19,013	18,134	7.250	7.39	5.70	28.49	34.19	0.82	0.30	0.00	0.00	35.31	5,161,736	64.5	41,997.7
2025	14,796,328	2,443,199	24,078	23,253	7.250	7.32	5.50	29.08	34.58	0.81	0.37	0.00	0.00	35.76	5,291,764	66.3	40,592.6
2026	14,981,745	2,918,397	29,000	28,230	7.250	7.24	5.32	29.81	35.13	0.81	0.44	0.00	0.00	36.38	5,449,857	68.6	38,548.4
2027	15,169,785	3,391,493	33,890	33,173	7.250	7.17	5.13	30.41	35.54	0.80	0.50	0.00	0.00	36.84	5,588,772	70.9	36,277.9
2028	15,357,710	3,852,069	38,645	37,981	7.250	7.11	4.93	30.85	35.78	0.80	0.56	0.01	0.00	37.15	5,705,963	73.4	33,758.1
2029	15,542,318	4,306,975	43,341	42,725	7.250	7.04	4.74	31.35	36.09	0.79	0.62	0.01	0.01	37.52	5,831,598	76.0	30,887.2
2030	15,725,852	4,754,610	47,958	47,388	7.250	6.98	4.54	31.90	36.44	0.78	0.68	0.01	0.01	37.92	5,963,763	79.1	27,316.1
2031	15,904,772	5,210,923	52,618	52,028	7.250	6.92	4.35	32.45	36.80	0.78	0.74	0.01	0.01	38.34	6,098,526	81.8	24,040.9
2032	16,076,375	5,671,924	57,328	56,701	7.250	6.86	4.14	32.89	37.03	0.77	0.79	0.01	0.01	38.61	6,206,520	84.7	20,418.4
2033	16,234,384	6,134,904	62,059	61,390	7.250	6.80	3.94	33.67	37.61	0.77	0.85	0.01	0.01	39.25	6,371,392	87.9	16,371.5
2034	16,378,481	6,603,209	66,843	66,139	7.250	6.74	3.73	34.50	38.23	0.77	0.91	0.01	0.01	39.93	6,540,730	91.3	11,863.5
2035	16,514,636	7,080,481	71,716	70,980	7.250	6.68	3.52	35.39	38.91	0.77	0.96	0.01	0.01	40.66	6,715,229	95.1	6,792.6
2036	16,647,720	7,568,254	76,697	75,932	7.250	6.62	3.29	36.99	39.58	0.77	1.02	0.01	0.01	42.09	6,900,496	96.8	4,384.0
2037	16,777,094	8,065,581	81,770	80,980	7.250	6.55	3.07	38.46	40.27	0.77	1.08	0.01	0.01	43.40	7,098,876	98.2	2,553.4
2038	16,906,209	8,572,800	86,946	86,133	7.250	6.48	2.85	40.01	41.00	0.77	1.14	0.01	0.01	44.61	7,303,740	99.3	917.3
2039	17,033,850	9,090,699	92,228	91,398	7.250	6.41	2.62	41.82	41.84	0.77	1.20	0.01	0.01	45.73	7,515,046	100.3	(448.7)
2040	17,163,977	9,618,611	97,607	96,761	7.250	6.34	2.39	43.74	42.89	0.77	1.26	0.01	0.01	46.78	7,732,381	101.2	(1,601.6)
2041	17,298,228	10,156,361	103,084	102,231	7.250	6.26	2.17	45.76	43.93	0.77	1.32	0.01	0.01	47.74	7,958,480	101.8	(2,558.6)
2042	17,440,524	10,702,676	108,651	107,791	7.250	6.19	1.94	47.92	45.06	0.77	1.38	0.01	0.01	48.61	8,194,727	102.0	(2,779.0)
2043	17,596,164	11,257,708	114,307	113,451	7.250	6.11	1.72	50.24	46.21	0.77	1.44	0.01	0.01	49.36	8,441,048	102.2	(2,998.8)
2044	17,771,968	11,819,163	120,029	119,179	7.250	6.04	1.51	52.67	47.36	0.77	1.50	0.01	0.01	50.01	8,697,335	102.4	(3,234.3)
2045	17,974,546	12,385,093	125,800	124,957	7.250	5.97	1.32	55.14	48.51	0.77	1.55	0.01	0.01	50.66	8,963,868	102.6	(3,482.7)
2046	18,209,136	12,950,682	131,548	130,766	7.250	5.90	1.15	57.69	49.66	0.77	1.60	0.01	0.01	51.21	9,240,603	102.8	(3,750.1)
2047	18,484,144	13,518,521	137,324	136,597	7.250	5.83	1.00	60.34	50.81	0.77	1.65	0.01	0.01	51.66	9,527,855	103.0	(4,042.0)
2048	18,803,046	14,085,549	143,070	142,421	7.250	5.77	0.88	63.08	51.96	0.77	1.69	0.02	0.02	51.91	9,825,543	103.3	(4,352.4)
2049	19,175,430	14,657,141	148,878	148,296	7.250	5.72	0.78	65.91	53.11	0.77	1.72	0.02	0.02	52.06	10,134,707	103.6	(4,685.2)
2050	19,598,684	15,234,795	154,746	154,236	7.250	5.67	0.71	68.84	54.26	0.77	1.75	0.02	0.02	52.11	10,454,877	103.9	(5,043.8)
2051	20,065,604	15,819,920	160,704	160,259	7.250	5.63	0.65	71.87	55.41	0.77	1.77	0.02	0.02	52.16	10,786,119	104.2	(5,433.0)
2052	20,573,944	16,416,990	166,782	166,415	7.250	5.60	0.60	74.90	56.56	0.77	1.80	0.02	0.02	52.21	11,128,424	104.0	(5,196.2)
2053	21,119,396	17,016,334	172,901	172,591	7.250	5.57	0.56	77.93	57.71	0.77	1.81	0.02	0.02	52.26	11,481,597	103.8	(4,945.3)
2054	21,692,815	17,610,768	178,978	178,733	7.250	5.55	0.53	80.96	58.56	0.77	1.83	0.02	0.02	52.31	11,846,662	103.6	(4,720.1)
<b>Total</b>														109,224,430			

Note: Assumes an investment return of 20.00% for fiscal year ending 6/30/2021 and 7.25% per year thereafter.

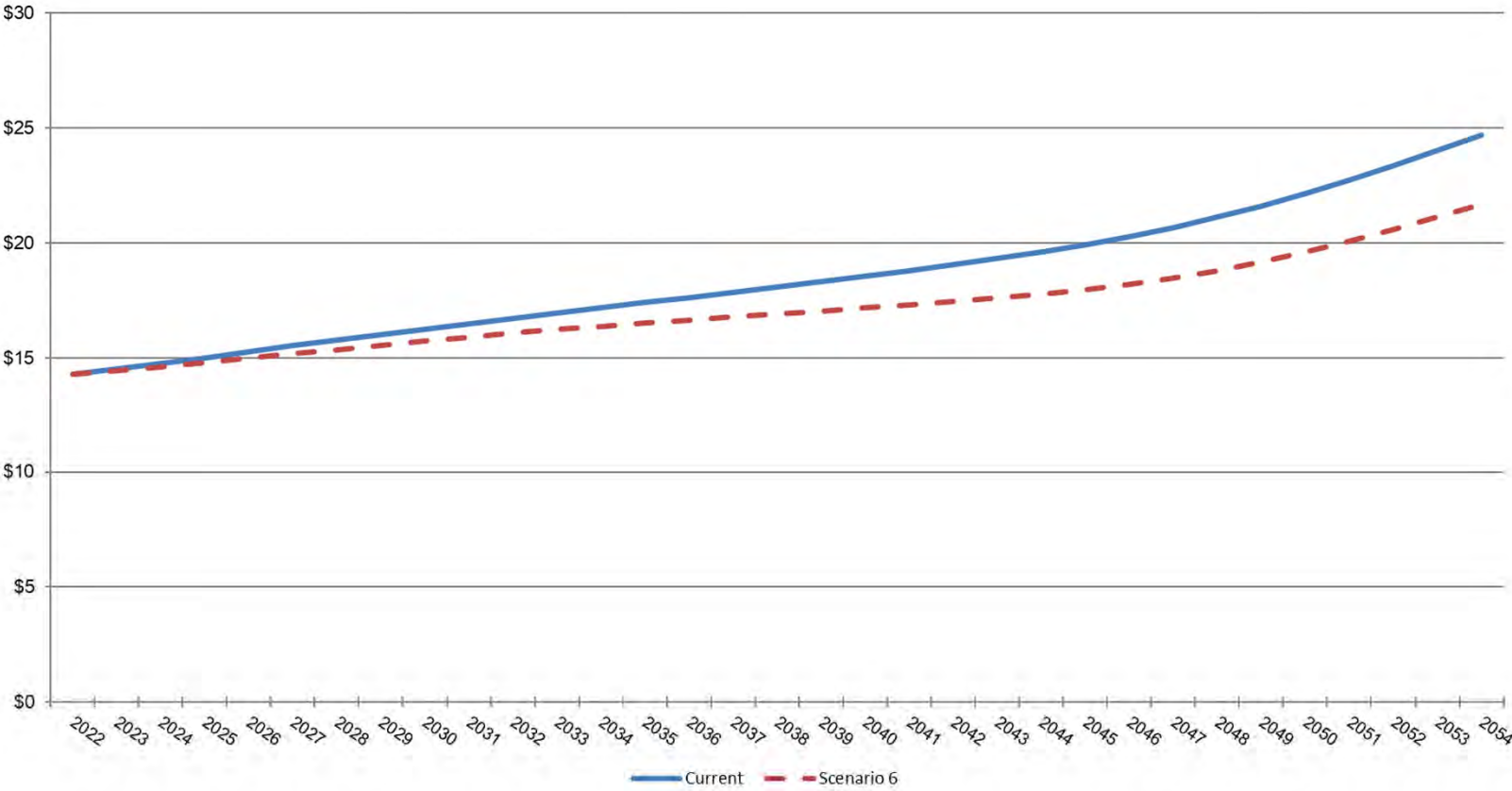
**Scenario 6 Assumptions - Comparison of Projected System Employer Contribution Amounts (Millions)**  
 Revised Demographic, 4.75% Average Salary Increase and 7.25% Interest Rate Assumption (Effective June 30, 2021 Valuation)



**Scenario 6 Assumptions - Comparison of Projected System Employer Contribution Rates**  
 Revised Demographic, 4.75% Average Salary Increase and 7.25% Interest Rate Assumption (Effective June 30, 2021 Valuation)

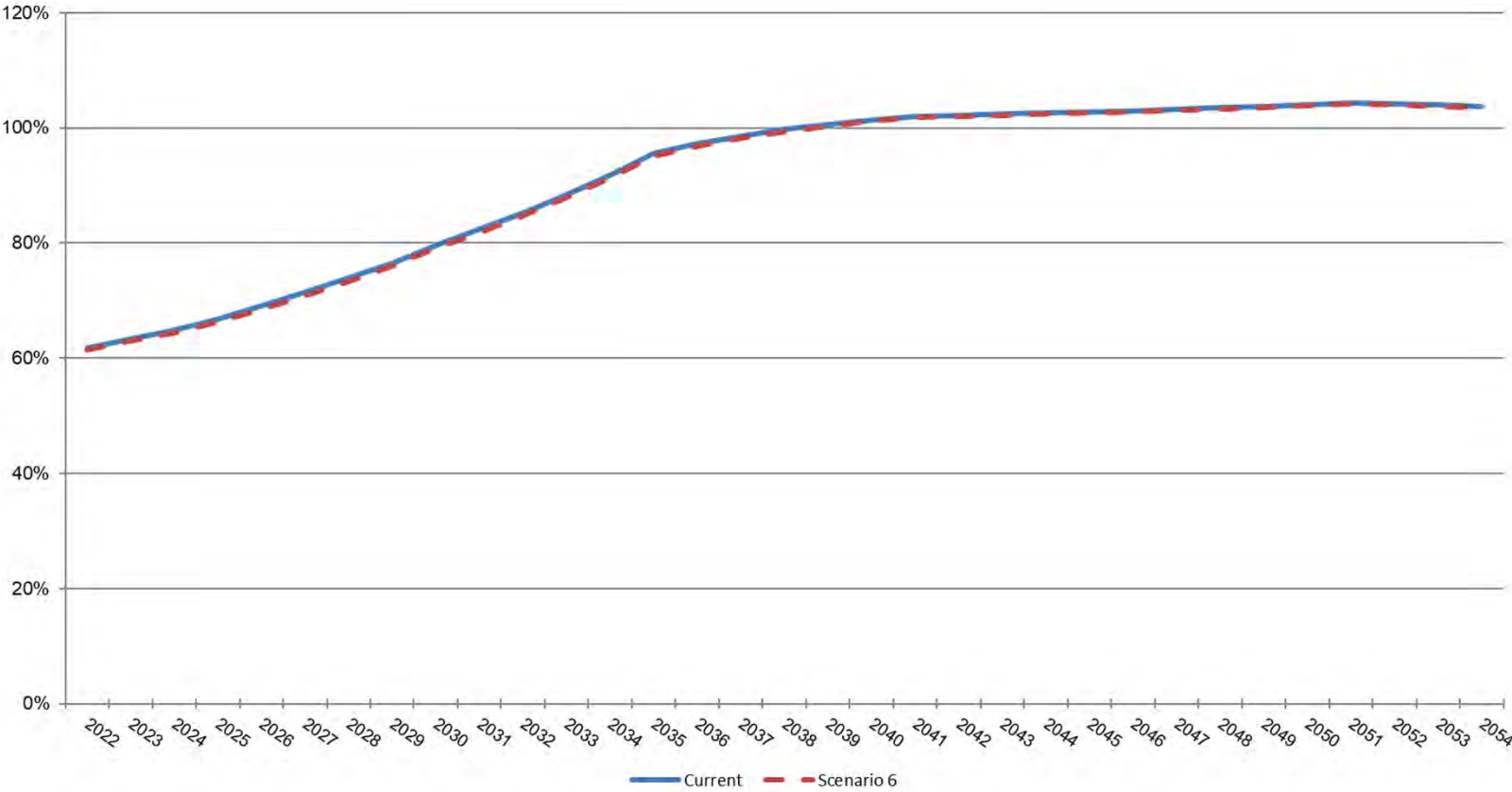


**Scenario 6 Assumptions - Comparison of Projected System Appropriation Payroll (Billions)**  
 Revised Demographic, 4.75% Average Salary Increase and 7.25% Interest Rate Assumption (Effective June 30, 2021 Valuation)



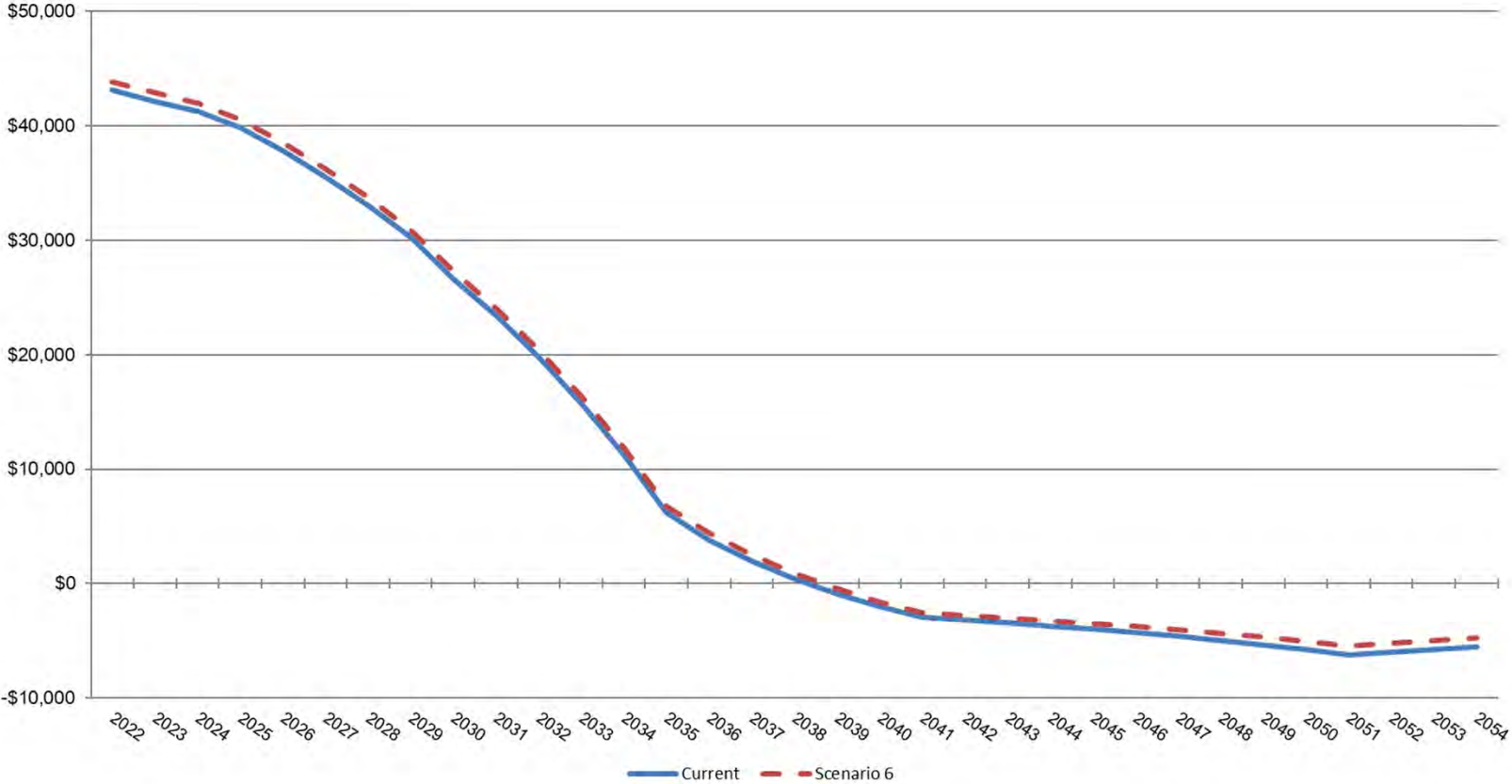
Note: Assumes a 3.50% annual payroll growth.

**Scenario 6 Assumptions - Comparison of Projected System Funded Ratio (Actuarial Value of Assets)**  
 Revised Demographic, 4.75% Average Salary Increase and 7.25% Interest Rate Assumption (Effective June 30, 2021 Valuation)



# Scenario 6 Assumptions - Comparison of Projected System Unfunded Accrued Liability (Actuarial Value of Assets and in Millions)

Revised Demographic, 4.75% Average Salary Increase and 7.25% Interest Rate Assumption (Effective June 30, 2021 Valuation)





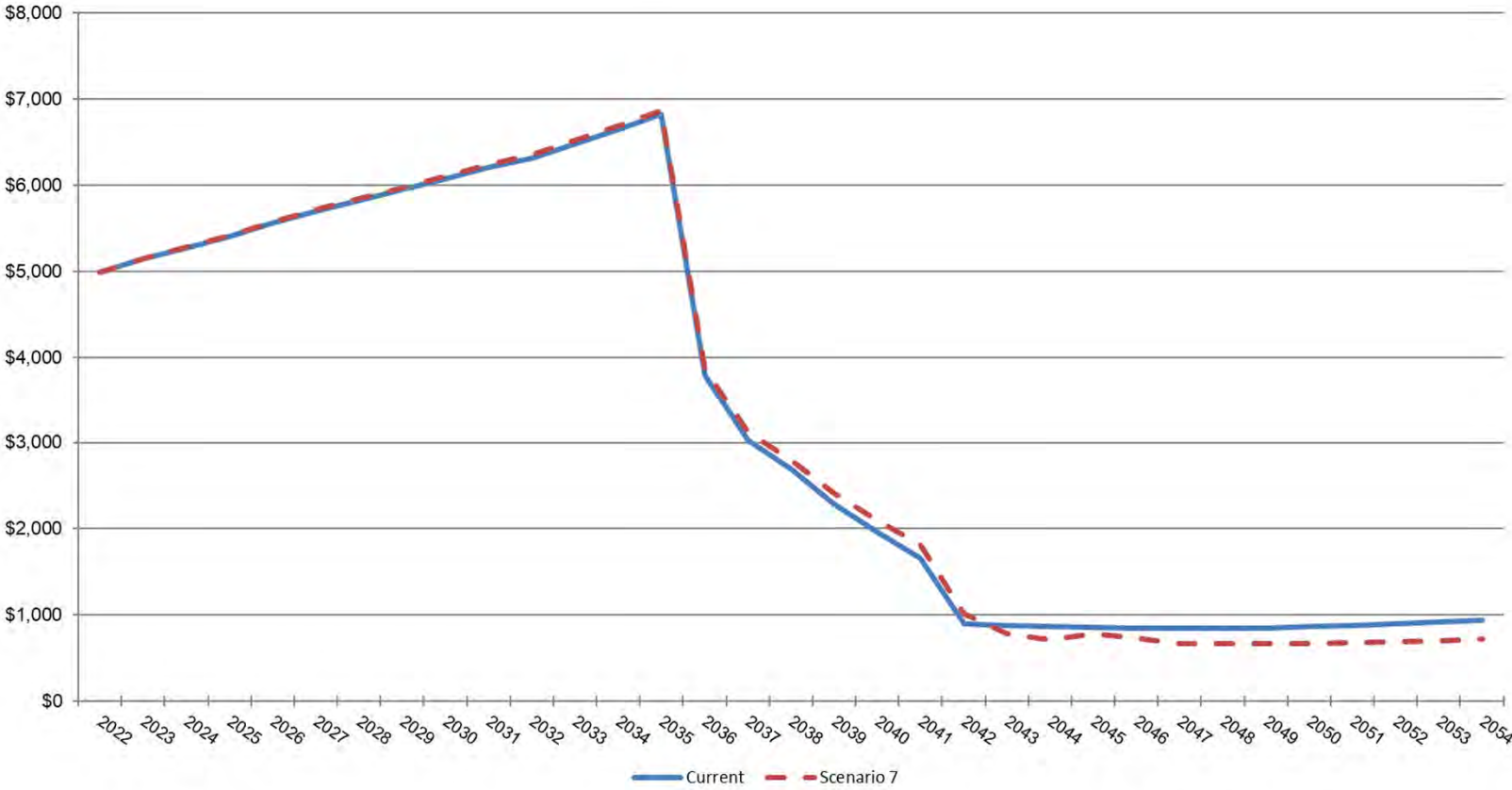
## Scenario 7 Assumptions - Projection of Contribution Rates and Funded Ratios As of June 30, 2020

Revised Demographic, 4.75% Average Salary Increase and 7.125% Interest Rate Assumption (Effective June 30, 2021 Valuation)

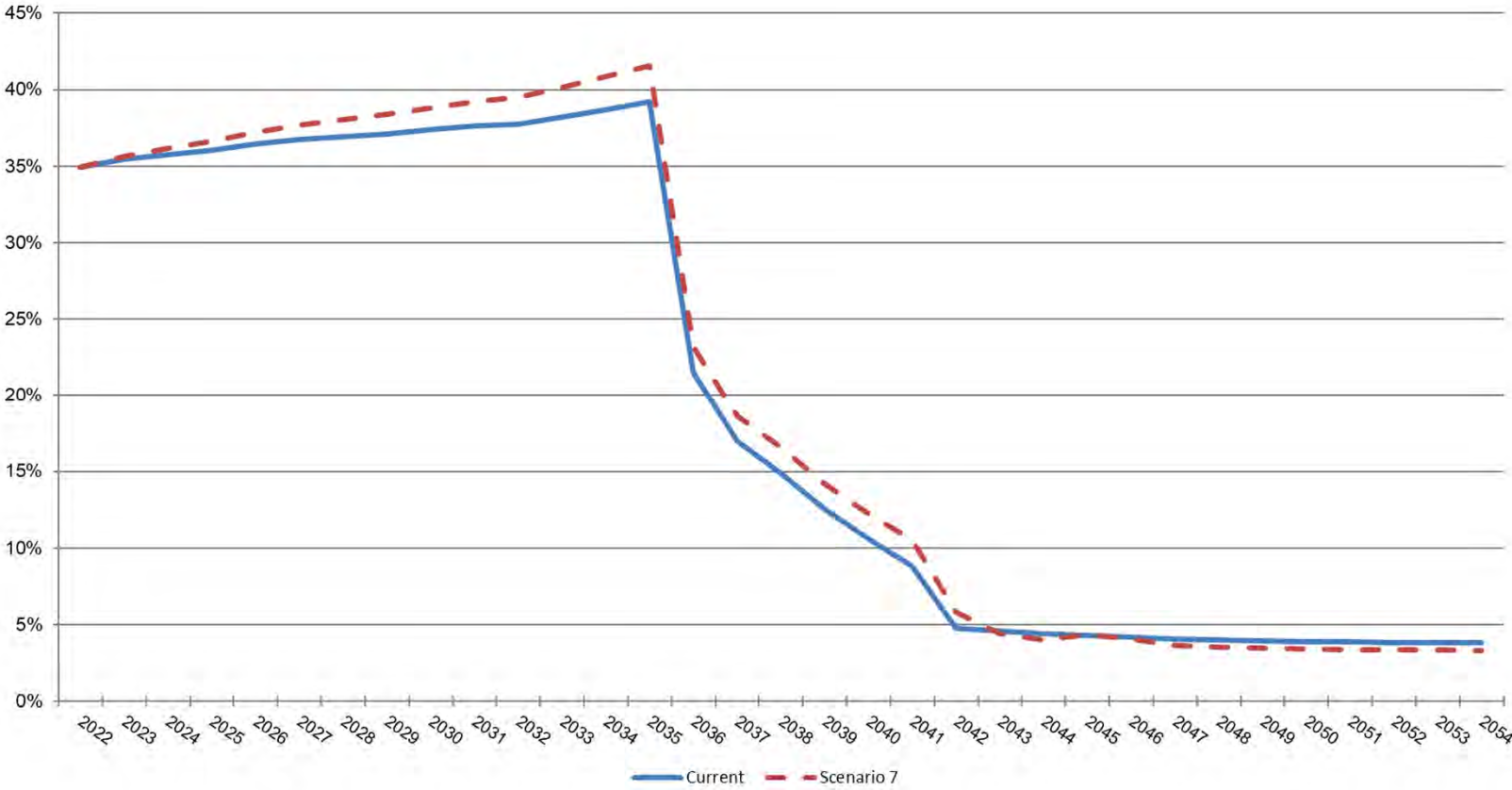
Fiscal Year Ending June 30	Appropriation Payroll (\$Thousands)	DC Payroll (\$Thousands)			Fiscal Year Market Rate of Return	Member Contribution Rate	Employer Normal Cost	Employer Unfunded Liability Rate	Preliminary Employer Pension Rate	Health Care Contribution	Employer DC Contribution Rate			Total Employer Contribution Rate	Projected Total Employer Contribution (\$Thousands)	Funded Ratio	Unfunded Accrued Liability (Based on Actuarial Value of Assets & \$Millions)
		Class TG	Class TH	Class DC Only Participants							Class T-G 2.25% DC	Class T-H 2.00% DC	DC Only Participants 2.00% DC				
2019	\$ 13,775,000					7.57 %	7.59 %	25.01 %	32.60 %	0.83 %			33.43 %			\$ 44,134.2	
2020	13,880,000	\$ 389,350	\$ 179,700	\$ 29,950		7.59	7.49	25.87	33.36	0.84			34.29		59.2	44,034.5	
2021	14,078,000	720,583	332,577	55,429	20.00 %	7.61	7.37	26.14	33.51	0.82	0.12	0.05	0.01	34.51	\$ 4,858,318	59.1	45,940.9
<b>2022</b>	<b>14,289,000</b>	937,344	8,423	7,440	7.125	<b>7.56</b>	<b>7.20</b>	<b>26.79</b>	<b>33.99</b>	<b>0.80</b>	0.15	0.00	0.00	<b>34.94</b>	<b>4,992,577</b>	60.5	45,389.9
2023	14,452,017	1,449,534	13,762	12,824	7.125	7.48	6.26	28.33	34.59	0.81	0.23	0.00	0.00	35.63	5,149,254	62.1	44,431.9
2024	14,619,441	1,955,000	19,013	18,134	7.125	7.39	6.07	28.96	35.03	0.82	0.30	0.00	0.00	36.15	5,284,512	63.6	43,533.1
2025	14,796,328	2,443,199	24,078	23,253	7.125	7.32	5.86	29.57	35.43	0.81	0.37	0.00	0.00	36.61	5,416,254	65.5	42,114.9
2026	14,981,745	2,918,397	29,000	28,230	7.125	7.24	5.68	30.30	35.98	0.81	0.44	0.00	0.00	37.23	5,577,408	67.7	40,056.5
2027	15,169,785	3,391,493	33,890	33,173	7.125	7.17	5.48	30.92	36.40	0.80	0.50	0.00	0.00	37.70	5,718,260	70.1	37,770.9
2028	15,357,710	3,852,069	38,645	37,981	7.125	7.10	5.28	31.37	36.65	0.80	0.56	0.01	0.00	38.02	5,839,393	72.5	35,234.7
2029	15,542,318	4,306,975	43,341	42,725	7.125	7.04	5.07	31.89	36.96	0.79	0.62	0.01	0.01	38.39	5,965,926	75.2	32,346.4
2030	15,725,852	4,754,610	47,958	47,388	7.125	6.98	4.87	32.45	37.32	0.78	0.68	0.01	0.01	38.80	6,102,122	78.2	28,757.2
2031	15,904,772	5,210,923	52,618	52,028	7.125	6.92	4.66	33.02	37.68	0.78	0.74	0.01	0.01	39.22	6,237,928	81.0	25,463.6
2032	16,076,375	5,671,924	57,328	56,701	7.125	6.86	4.46	33.47	37.93	0.77	0.79	0.01	0.01	39.51	6,352,178	83.9	21,821.1
2033	16,234,384	6,134,904	62,059	61,390	7.125	6.80	4.24	34.27	38.51	0.77	0.85	0.01	0.01	40.15	6,517,911	87.0	17,753.7
2034	16,378,481	6,603,209	66,843	66,139	7.125	6.74	4.03	35.12	39.15	0.77	0.91	0.01	0.01	40.85	6,691,390	90.4	13,224.8
2035	16,514,636	7,080,481	71,716	70,980	7.125	6.68	3.80	36.03	39.83	0.76	0.96	0.01	0.01	41.58	6,866,807	94.1	8,197.0
2036	16,647,720	7,568,254	76,697	75,932	7.125	6.62	3.57	36.96	40.56	0.76	1.02	0.01	0.01	42.32	7,052,422	97.8	5,816.9
2037	16,777,094	8,065,581	81,770	80,980	7.125	6.55	3.34	37.91	41.51	0.76	1.08	0.01	0.01	43.12	7,247,911	100.6	4,008.6
2038	16,906,209	8,572,800	86,946	86,133	7.125	6.48	3.11	38.93	42.54	0.76	1.14	0.01	0.01	43.97	7,443,807	104.1	2,389.9
2039	17,033,850	9,090,699	92,228	91,398	7.125	6.41	2.87	39.99	43.64	0.76	1.20	0.01	0.01	44.86	7,649,304	107.6	1,034.6
2040	17,163,977	9,618,611	97,607	96,761	7.125	6.34	2.63	41.10	44.79	0.76	1.26	0.01	0.01	45.79	7,864,801	111.1	(115.2)
2041	17,298,228	10,156,361	103,084	102,231	7.125	6.26	2.40	42.25	45.93	0.76	1.32	0.01	0.01	46.73	8,090,298	114.6	(1,077.9)
2042	17,440,524	10,702,676	108,651	107,791	7.125	6.19	2.16	43.36	47.06	0.76	1.38	0.01	0.01	47.62	8,325,795	118.1	(1,320.1)
2043	17,596,164	11,257,708	114,307	113,451	7.125	6.11	1.93	44.44	48.16	0.76	1.44	0.01	0.01	48.51	8,571,292	121.6	(1,359.2)
2044	17,771,968	11,819,163	120,029	119,179	7.125	6.04	1.71	45.51	49.21	0.76	1.50	0.01	0.01	49.36	8,826,789	125.1	(1,345.1)
2045	17,974,546	12,385,093	125,800	124,957	7.125	5.97	1.51	46.51	50.21	0.76	1.55	0.01	0.01	50.16	9,092,286	128.6	(1,411.8)
2046	18,209,136	12,950,682	131,548	130,766	7.125	5.90	1.33	47.44	51.16	0.76	1.60	0.01	0.01	50.96	9,367,783	132.1	(1,440.0)
2047	18,484,144	13,518,521	137,324	136,597	7.125	5.83	1.18	48.31	52.01	0.76	1.65	0.01	0.01	51.66	9,653,280	135.6	(1,416.9)
2048	18,803,046	14,085,549	143,070	142,421	7.125	5.77	1.05	49.11	52.76	0.76	1.69	0.02	0.02	52.26	9,948,777	139.1	(1,381.9)
2049	19,175,430	14,657,141	148,878	148,296	7.125	5.72	0.94	49.84	53.41	0.76	1.72	0.02	0.02	52.81	10,254,274	142.6	(1,337.0)
2050	19,598,684	15,234,795	154,746	154,236	7.125	5.67	0.87	50.51	53.96	0.76	1.75	0.02	0.02	53.26	10,569,771	146.1	(1,283.0)
2051	20,065,604	15,819,920	160,704	160,259	7.125	5.63	0.80	51.14	54.41	0.76	1.77	0.02	0.02	53.61	10,895,268	149.6	(1,222.1)
2052	20,573,944	16,416,990	166,782	166,415	7.125	5.60	0.75	51.71	54.86	0.76	1.80	0.02	0.02	53.86	11,230,765	153.1	(823.7)
2053	21,119,396	17,016,334	172,901	172,591	7.125	5.57	0.71	52.21	55.21	0.76	1.81	0.02	0.02	54.01	11,576,262	156.6	(435.0)
2054	21,692,815	17,610,768	178,978	178,733	7.125	5.55	0.67	52.66	55.56	0.76	1.83	0.02	0.02	54.16	11,931,759	160.1	(78.3)
<b>Total</b>														113,174,055			

Note: Assumes an investment return of 20.00% for fiscal year ending 6/30/2021 and 7.125% per year thereafter.

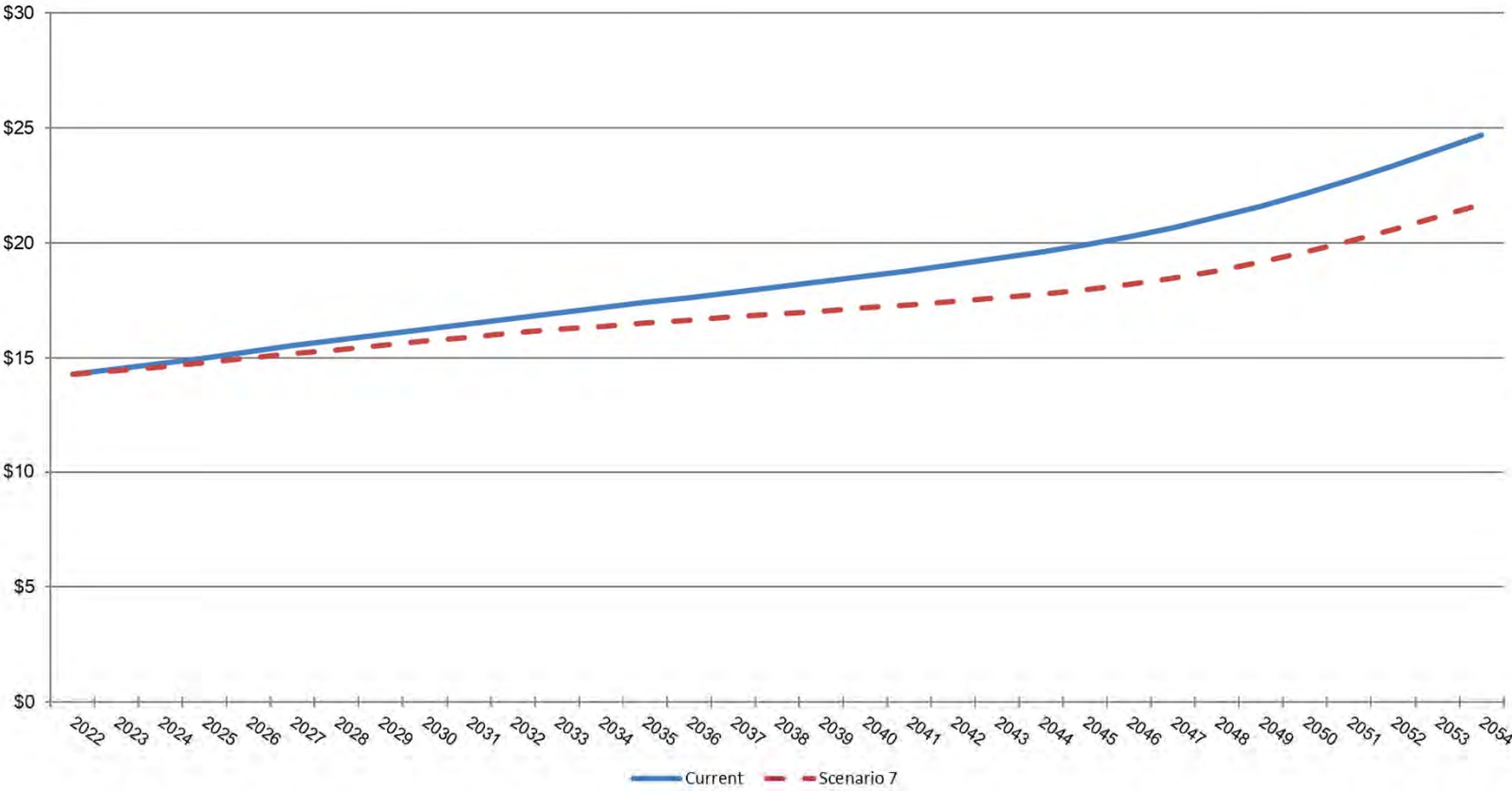
**Scenario 7 Assumptions - Comparison of Projected System Employer Contribution Amounts (Millions)**  
 Revised Demographic, 4.75% Average Salary Increase and 7.125% Interest Rate Assumption (Effective June 30, 2021 Valuation)



**Scenario 7 Assumptions - Comparison of Projected System Employer Contribution Rates**  
 Revised Demographic, 4.75% Average Salary Increase and 7.125% Interest Rate Assumption (Effective June 30, 2021 Valuation)

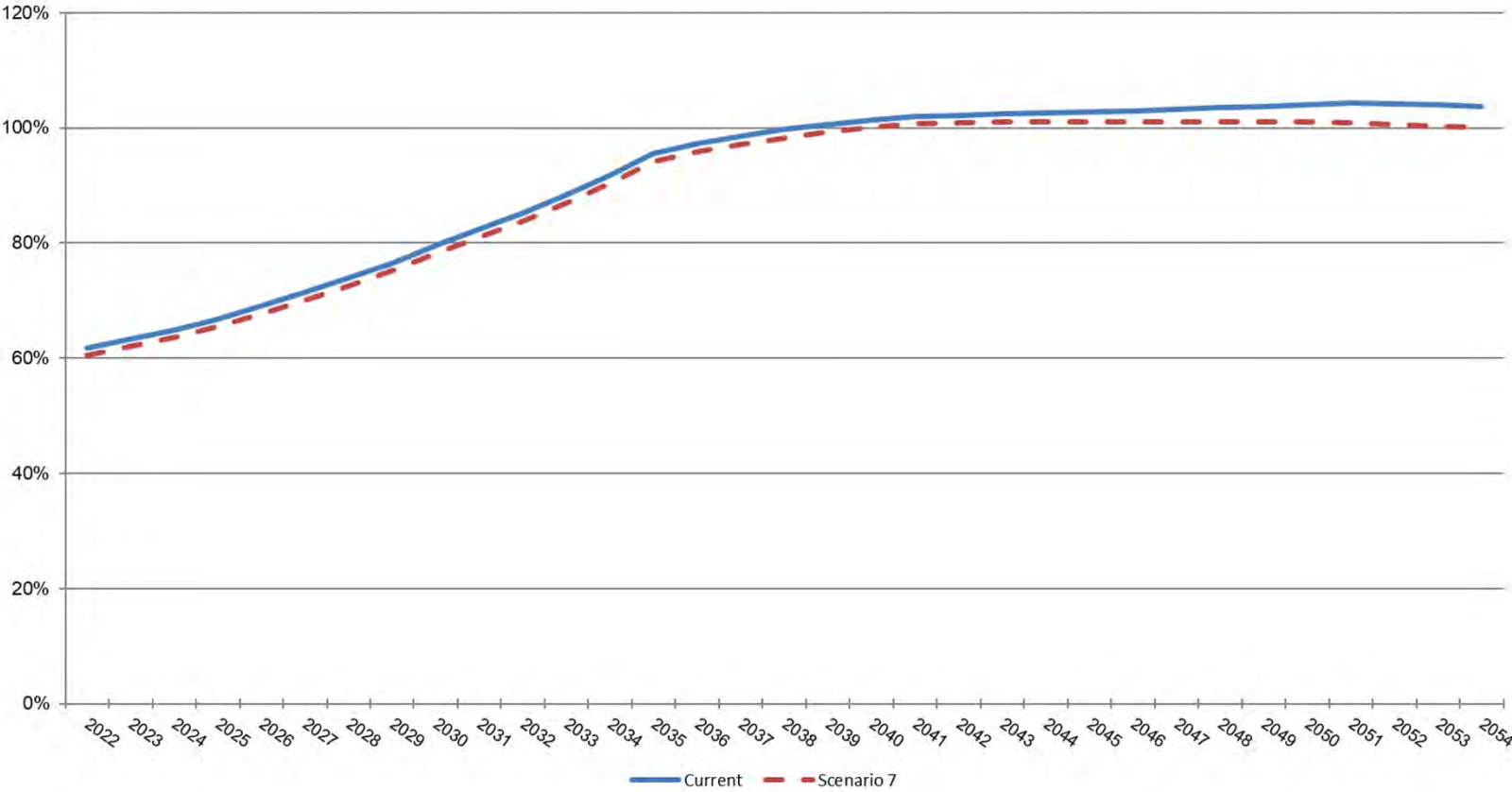


**Scenario 7 Assumptions - Comparison of Projected System Appropriation Payroll (Billions)**  
 Revised Demographic, 4.75% Average Salary Increase and 7.125% Interest Rate Assumption (Effective June 30, 2021 Valuation)



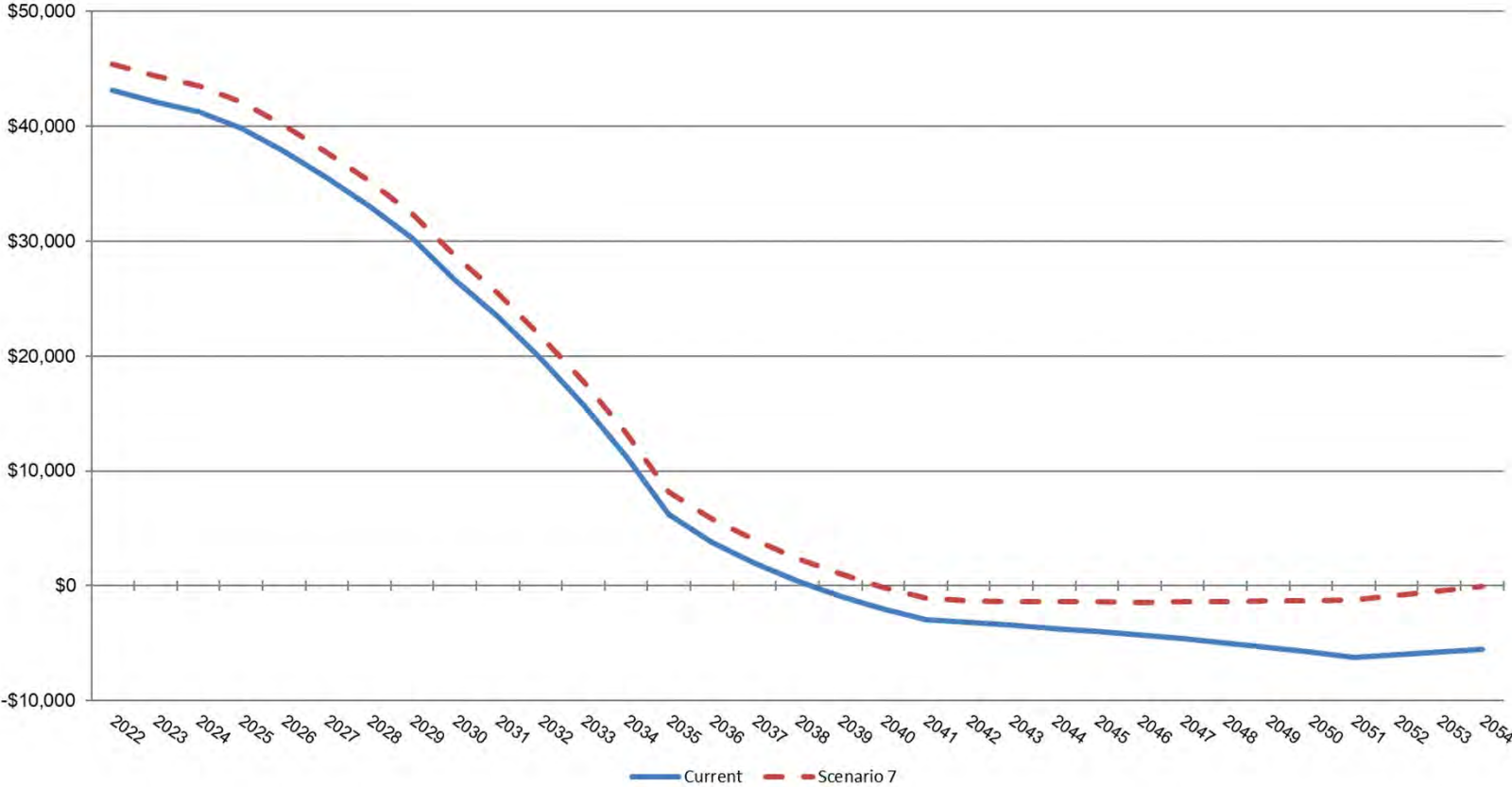
Note: Assumes a 3.50% annual payroll growth.

**Scenario 7 Assumptions - Comparison of Projected System Funded Ratio (Actuarial Value of Assets)**  
Revised Demographic, 4.75% Average Salary Increase and 7.125% Interest Rate Assumption (Effective June 30, 2021 Valuation)



# Scenario 7 Assumptions - Comparison of Projected System Unfunded Accrued Liability (Actuarial Value of Assets and in Millions)

Revised Demographic, 4.75% Average Salary Increase and 7.125% Interest Rate Assumption (Effective June 30, 2021 Valuation)



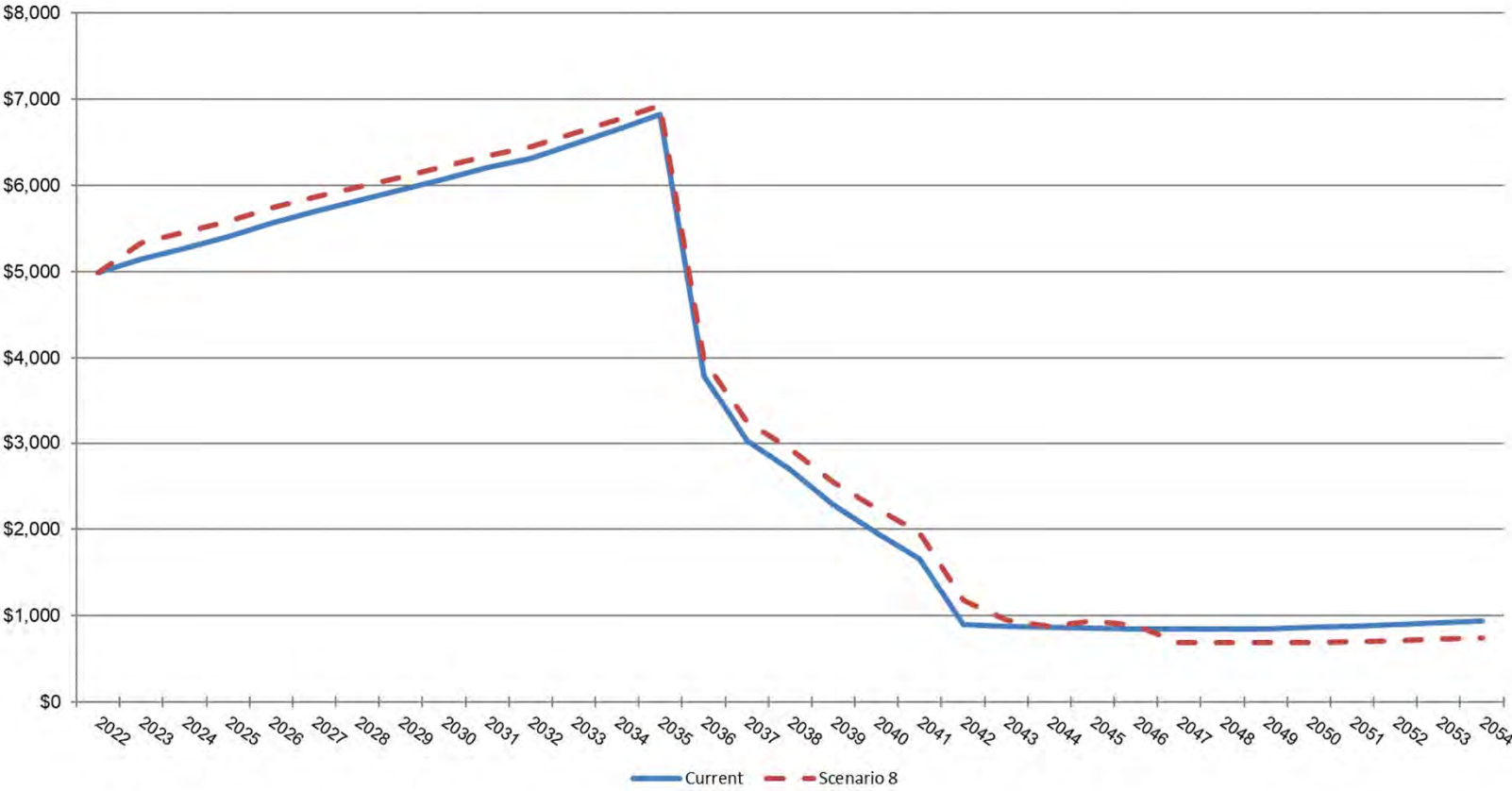
## Scenario 8 Assumptions - Projection of Contribution Rates and Funded Ratios As of June 30, 2020

Revised Demographic, 4.75% Average Salary Increase and 7.00% Interest Rate Assumption (Effective June 30, 2021 Valuation)

Fiscal Year Ending June 30	Appropriation Payroll (\$Thousands)	DC Payroll (\$Thousands)			Fiscal Year Market Rate of Return	Member Contribution Rate	Employer Normal Cost	Employer Unfunded Liability Rate	Preliminary Employer Pension Rate	Health Care Contribution	Employer DC Contribution Rate			Total Employer Contribution Rate	Projected Total Employer Contribution (\$Thousands)	Funded Ratio	Unfunded Accrued Liability (Based on Actuarial Value of Assets & \$Millions)
		Class TG	Class TH	Class DC Only Participants							Class T-G 2.25% DC	Class T-H 2.00% DC	DC Only Participants 2.00% DC				
2019	\$ 13,775,000					7.57 %	7.59 %	25.01 %	32.60 %	0.83 %				33.43 %		58.1 %	\$ 44,134.2
2020	13,880,000	\$ 389,350	\$ 179,700	\$ 29,950		7.59	7.49	25.87	33.36	0.84	0.06 %	0.03 %	0.00 %	34.29		<b>59.2</b>	<b>44,034.5</b>
2021	14,078,000	720,583	332,577	55,429	20.00 %	7.61	7.37	26.14	33.51	0.82	0.12	0.05	0.01	34.51	\$ 4,858,318	58.4	47,408.9
<b>2022</b>	<b>14,289,000</b>	937,344	8,423	7,440	7.00	<b>7.56</b>	<b>7.20</b>	<b>26.79</b>	<b>33.99</b>	<b>0.80</b>	0.15	0.00	0.00	<b>34.94</b>	<b>4,992,577</b>	59.7	46,957.9
2023	14,399,686	1,444,285	13,712	12,778	7.00	7.48	6.63	29.34	35.97	0.82	0.23	0.00	0.00	37.02	5,330,764	61.4	45,923.4
2024	14,566,504	1,947,921	18,944	18,068	7.00	7.40	6.43	29.91	36.34	0.82	0.30	0.00	0.00	37.46	5,457,211	62.9	44,950.2
2025	14,742,751	2,434,352	23,991	23,169	7.00	7.32	6.22	30.47	36.69	0.81	0.37	0.00	0.00	37.87	5,583,038	64.8	43,460.5
2026	14,927,496	2,907,829	28,895	28,127	7.00	7.24	6.03	31.15	37.18	0.82	0.44	0.00	0.00	38.44	5,737,925	67.1	41,334.7
2027	15,114,855	3,379,212	33,767	33,052	7.00	7.17	5.82	31.71	37.53	0.80	0.50	0.00	0.00	38.83	5,868,710	69.5	38,987.7
2028	15,302,099	3,838,121	38,505	37,844	7.00	7.10	5.61	32.10	37.71	0.80	0.56	0.01	0.00	39.08	5,980,345	72.0	36,397.7
2029	15,486,039	4,291,379	43,184	42,570	7.00	7.04	5.40	32.55	37.95	0.80	0.62	0.01	0.01	39.39	6,099,915	74.6	33,464.4
2030	15,668,909	4,737,394	47,785	47,216	7.00	6.98	5.19	33.05	38.24	0.78	0.68	0.01	0.01	39.72	6,223,920	77.7	29,840.7
2031	15,847,181	5,192,054	52,428	51,840	7.00	6.92	4.97	33.55	38.52	0.78	0.74	0.01	0.01	40.06	6,348,325	80.4	26,525.2
2032	16,018,162	5,651,386	57,120	56,496	7.00	6.86	4.76	33.93	38.69	0.77	0.79	0.01	0.01	40.27	6,450,193	83.3	22,874.8
2033	16,175,600	6,112,690	61,834	61,168	7.00	6.80	4.54	34.65	39.19	0.77	0.85	0.01	0.01	40.83	6,604,898	86.4	18,814.9
2034	16,319,174	6,579,299	66,601	65,899	7.00	6.74	4.31	35.43	39.74	0.77	0.91	0.01	0.01	41.44	6,763,214	89.7	14,311.2
2035	16,454,837	7,054,843	71,457	70,723	7.00	6.68	4.08	36.26	40.34	0.77	0.96	0.01	0.01	42.09	6,925,827	93.4	9,265.3
2036	16,587,438	7,540,849	76,419	75,658	7.00	6.62	3.83	37.36	41.19	0.77	1.02	0.01	0.01	42.81	7,100,000	96.1	6,800.4
2037	16,716,345	8,036,376	81,474	80,687	7.00	6.55	3.60	38.36	42.06	0.77	1.08	0.01	0.01	43.59	7,285,000	98.6	4,885.6
2038	16,844,992	8,541,758	86,632	85,821	7.00	6.48	3.35	39.36	42.93	0.77	1.14	0.01	0.01	44.43	7,479,000	101.1	3,146.0
2039	16,972,171	9,057,782	91,894	91,067	7.00	6.41	3.10	40.36	43.79	0.77	1.20	0.01	0.01	45.32	7,681,000	103.6	1,651.2
2040	17,101,827	9,583,783	97,254	96,411	7.00	6.34	2.85	41.41	44.63	0.77	1.26	0.01	0.01	46.24	7,891,000	106.1	342.7
2041	17,235,591	10,119,585	102,711	101,861	7.00	6.26	2.61	42.50	45.49	0.77	1.32	0.01	0.01	47.18	8,108,000	108.6	(799.3)
2042	17,377,372	10,663,921	108,257	107,401	7.00	6.19	2.35	43.61	46.33	0.77	1.38	0.01	0.01	48.12	8,332,000	111.1	(1,262.8)
2043	17,532,448	11,216,944	113,893	113,041	7.00	6.11	2.12	44.76	47.13	0.77	1.44	0.01	0.01	49.06	8,564,000	113.6	(1,550.5)
2044	17,707,616	11,776,366	119,594	118,748	7.00	6.04	1.89	45.91	47.89	0.77	1.50	0.01	0.01	49.99	8,804,000	116.1	(1,808.2)
2045	17,909,460	12,340,247	125,345	124,504	7.00	5.97	1.67	47.14	48.61	0.77	1.55	0.01	0.01	50.91	9,051,000	118.6	(2,165.8)
2046	18,143,201	12,903,788	131,071	130,293	7.00	5.90	1.49	48.36	49.27	0.77	1.60	0.01	0.01	51.82	9,304,000	121.1	(2,509.8)
2047	18,417,213	13,469,570	136,827	136,103	7.00	5.83	1.33	(2.10)	(0.77)	0.77	1.65	0.01	0.01	52.71	9,564,000	123.6	(2,701.8)
2048	18,734,960	14,034,545	142,552	141,905	7.00	5.77	1.19	(2.08)	(0.89)	0.77	1.69	0.02	0.02	53.58	9,828,000	126.1	(2,903.9)
2049	19,105,996	14,604,068	148,339	147,759	7.00	5.72	1.08	(2.17)	(1.09)	0.77	1.72	0.02	0.02	54.44	10,096,000	128.6	(3,119.9)
2050	19,527,717	15,179,629	154,186	153,678	7.00	5.67	1.00	(2.47)	(1.47)	0.77	1.75	0.02	0.02	55.29	10,371,000	131.1	(3,352.2)
2051	19,992,947	15,762,637	160,122	159,673	7.00	5.63	0.93	(2.55)	(1.62)	0.77	1.77	0.02	0.02	56.13	10,650,000	133.6	(3,604.8)
2052	20,499,446	16,357,545	166,178	165,813	7.00	5.60	0.88	(2.36)	(1.48)	0.77	1.80	0.02	0.02	56.96	10,933,000	136.1	(3,372.6)
2053	21,042,922	16,954,717	172,275	171,966	7.00	5.57	0.84	(2.23)	(1.39)	0.77	1.81	0.02	0.02	57.78	11,220,000	138.6	(3,138.9)
2054	21,614,266	17,547,000	178,330	178,086	7.00	5.55	0.80	(1.98)	(1.18)	0.77	1.83	0.02	0.02	58.59	11,511,000	141.1	(2,934.6)
<b>Total</b>														116,653,061			

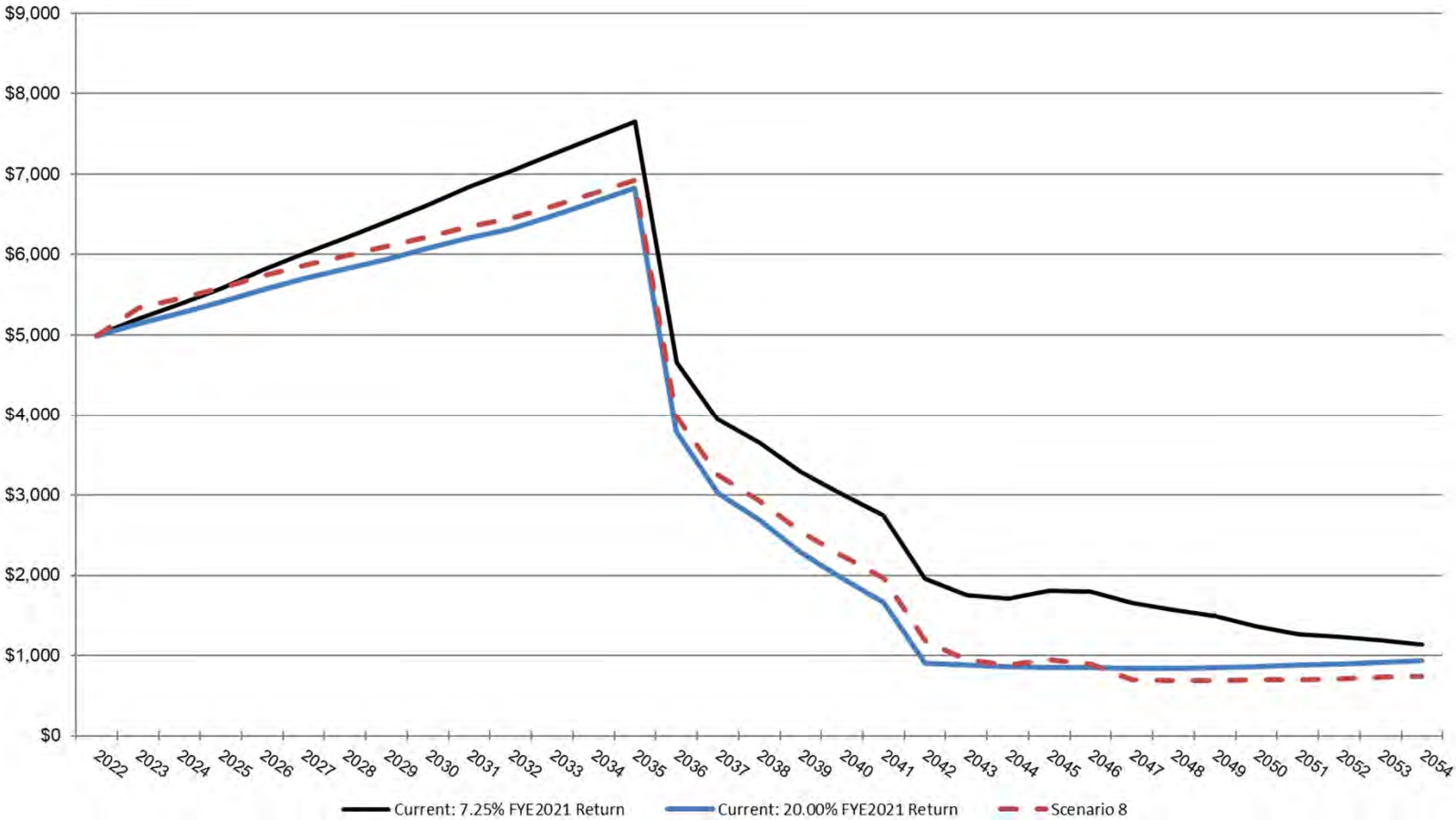
Note: Assumes an investment return of 20.00% for fiscal year ending 6/30/2021 and 7.00% per year thereafter.

**Scenario 8 Assumptions - Comparison of Projected System Employer Contribution Amounts (Millions)**  
 Revised Demographic, 4.75% Average Salary Increase and 7.00% Interest Rate Assumption (Effective June 30, 2021 Valuation)



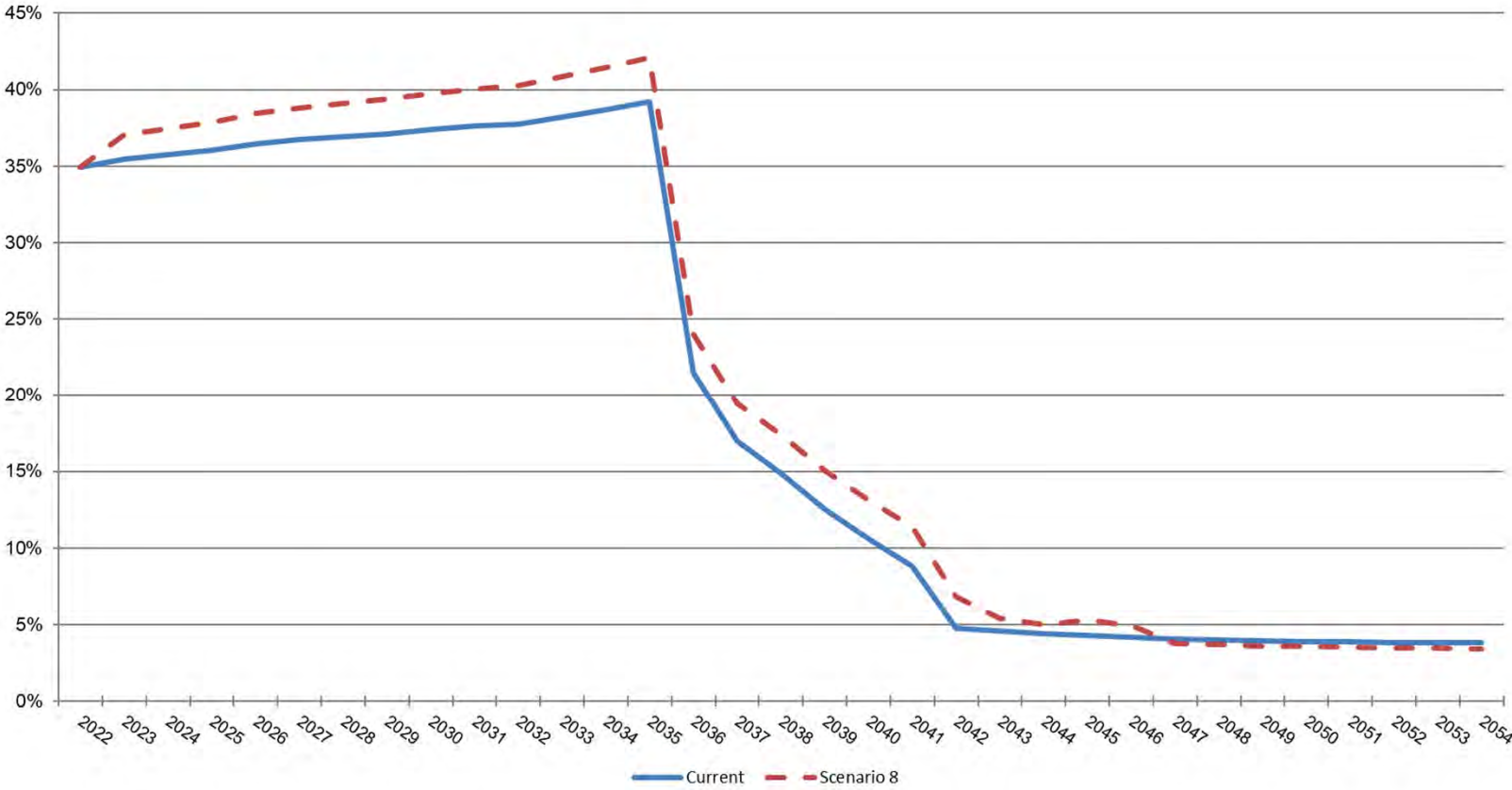


**Scenario 8 Assumptions - Comparison of Projected System Employer Contribution Amounts (Millions)**  
 Revised Demographic, 4.75% Average Salary Increase and 7.00% Interest Rate Assumption (Effective June 30, 2021 Valuation)

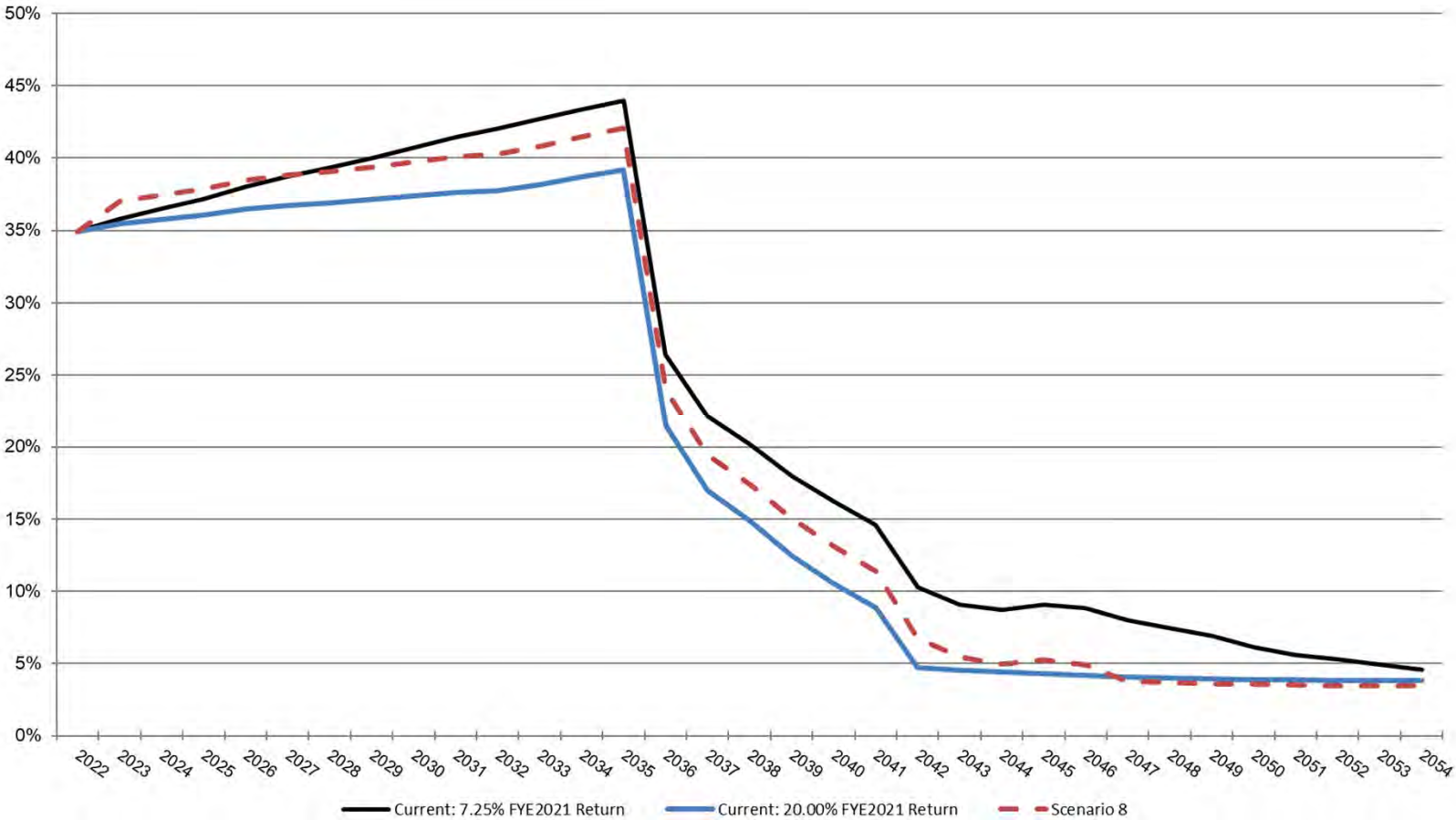


Note:  
 "Current" assumes the above stated fiscal year ending 2021 return and a 7.25% per year return thereafter.  
 Scenario 8 assumes a 20.0% return for fiscal year ending 2021 and a 7.00% per year return thereafter.

**Scenario 8 Assumptions - Comparison of Projected System Employer Contribution Rates**  
 Revised Demographic, 4.75% Average Salary Increase and 7.00% Interest Rate Assumption (Effective June 30, 2021 Valuation)

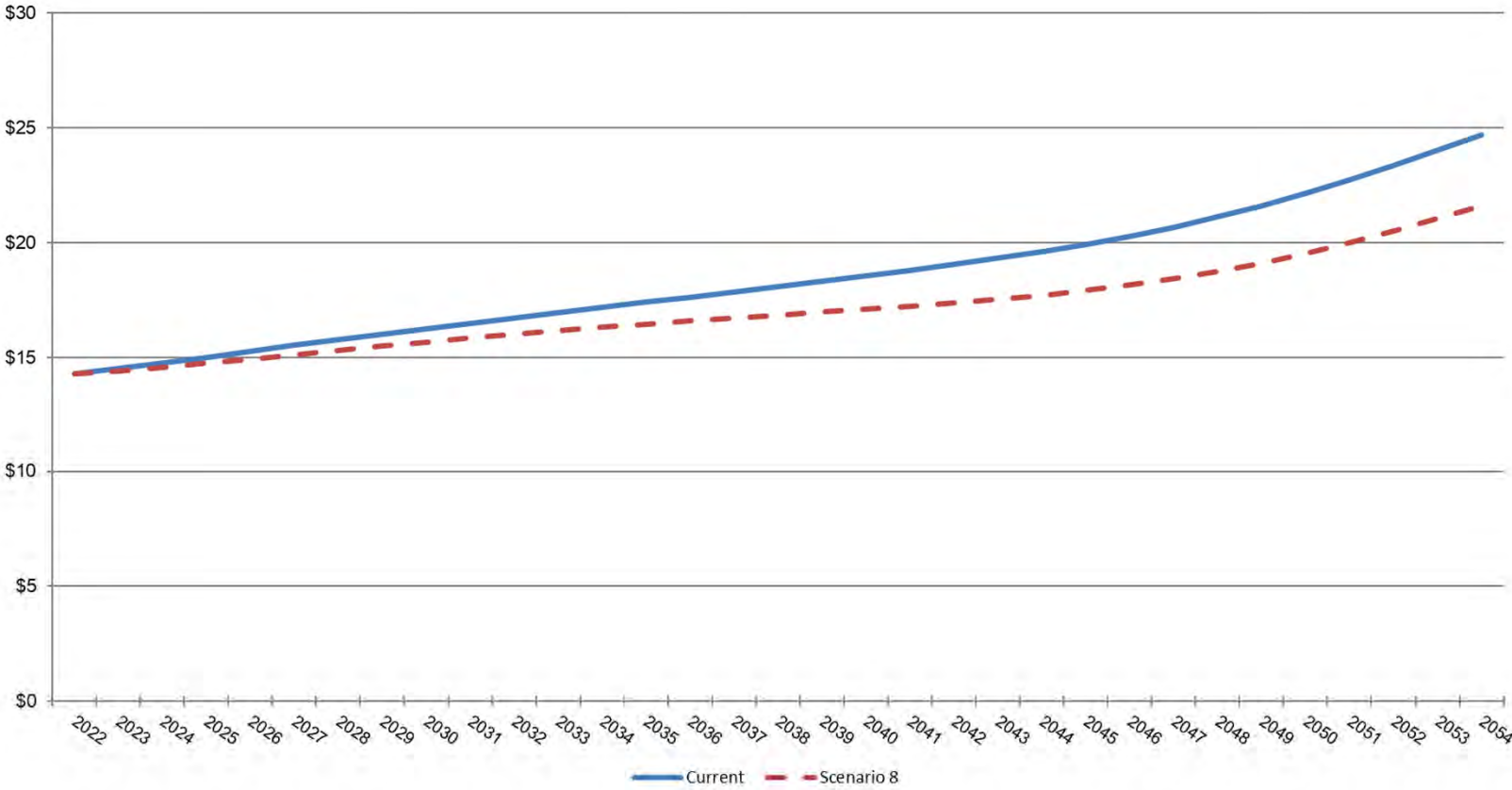


**Scenario 8 Assumptions - Comparison of Projected System Employer Contribution Rates**  
 Revised Demographic, 4.75% Average Salary Increase and 7.00% Interest Rate Assumption (Effective June 30, 2021 Valuation)



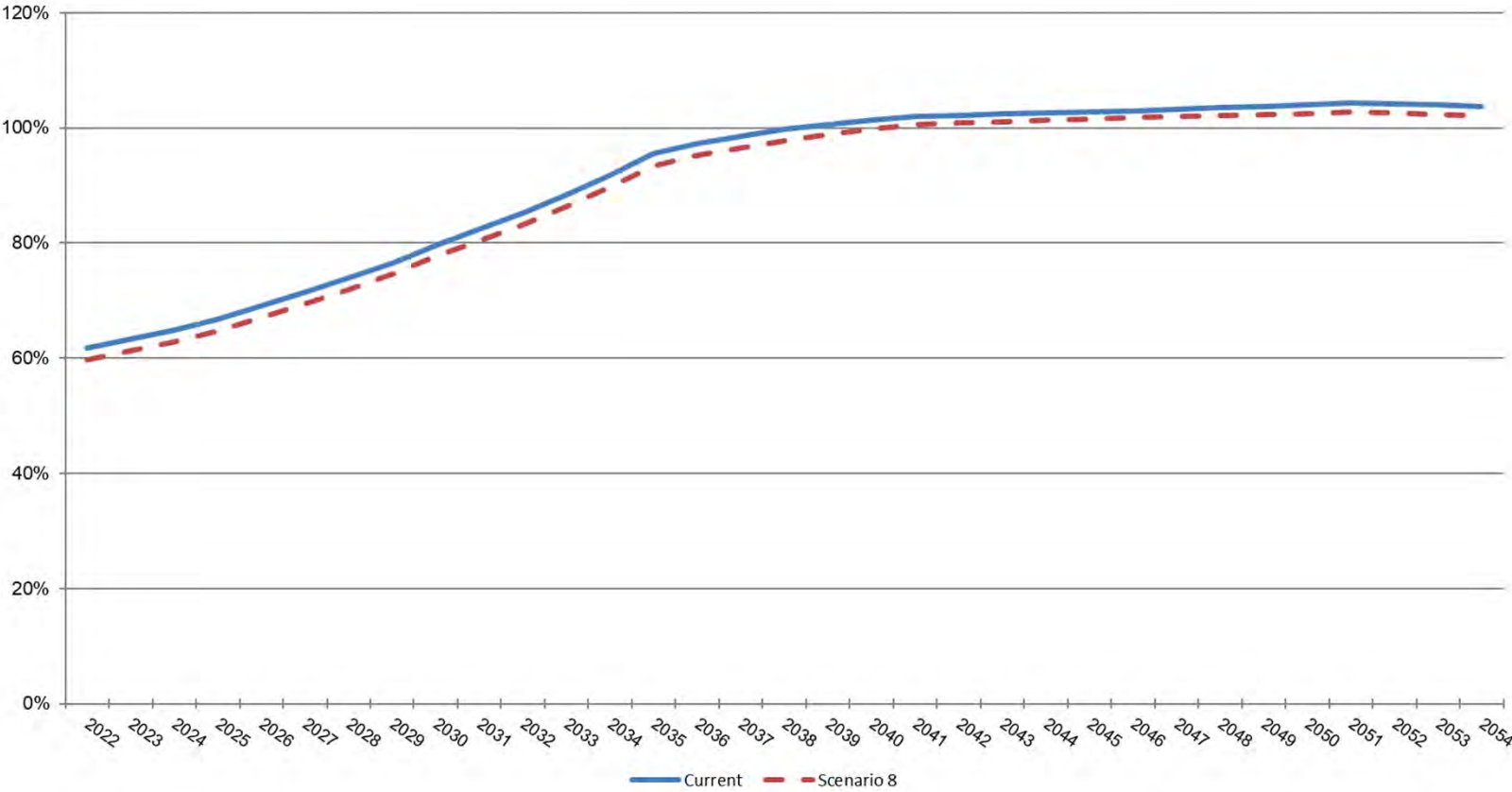
Note:  
 "Current" assumes the above stated fiscal year ending 2021 return and a 7.25% per year return thereafter.  
 Scenario 8 assumes a 20.0% return for fiscal year ending 2021 and a 7.00% per year return thereafter.

**Scenario 8 Assumptions - Comparison of Projected System Appropriation Payroll (Billions)**  
 Revised Demographic, 4.75% Average Salary Increase and 7.00% Interest Rate Assumption (Effective June 30, 2021 Valuation)



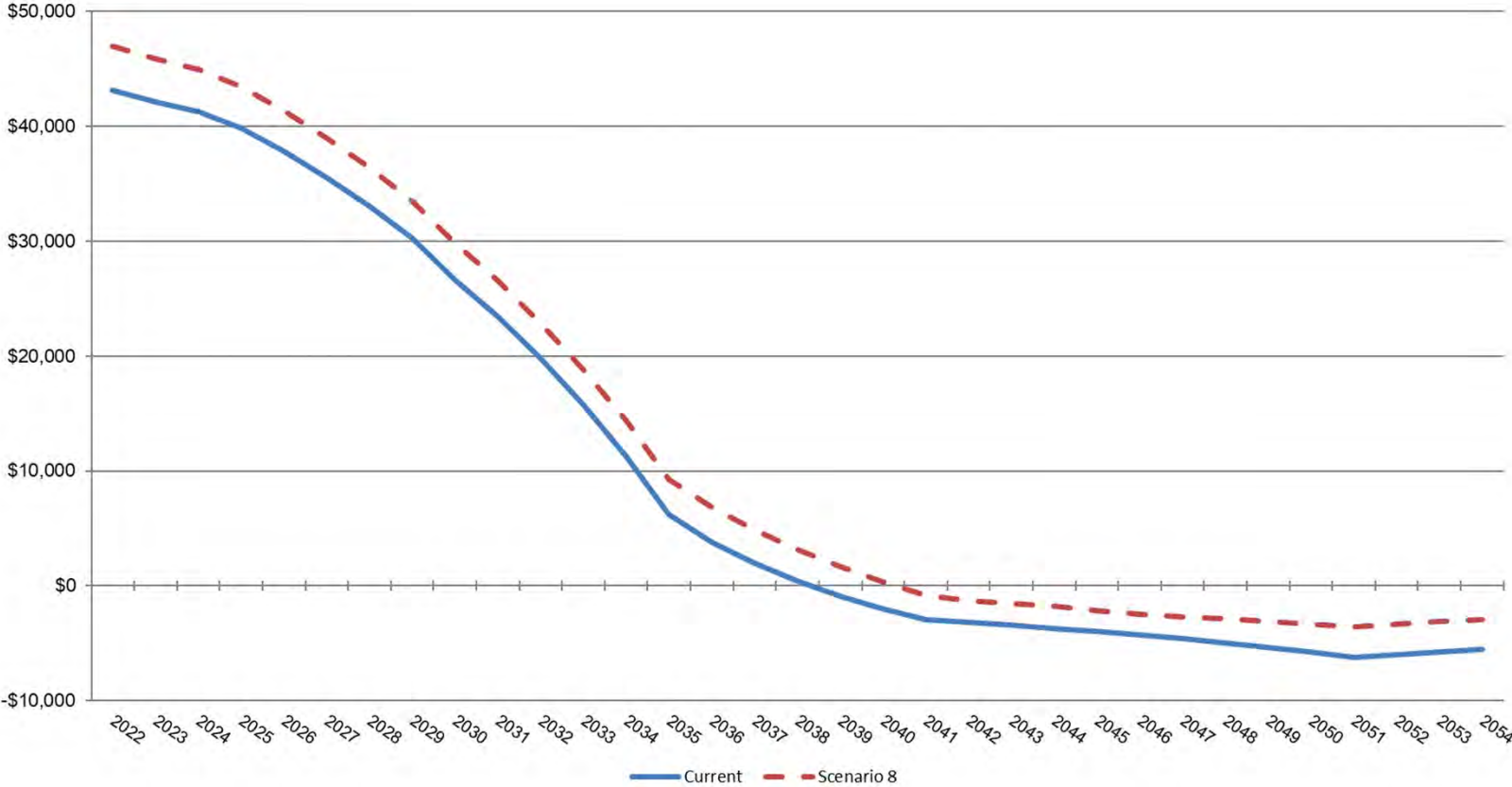
Note: Current assumes a 3.50% annual payroll growth while Scenario 8 assumes a 3.25% annual payroll growth.

**Scenario 8 Assumptions - Comparison of Projected System Funded Ratio (Actuarial Value of Assets)**  
Revised Demographic, 4.75% Average Salary Increase and 7.00% Interest Rate Assumption (Effective June 30, 2021 Valuation)



# Scenario 8 Assumptions - Comparison of Projected System Unfunded Accrued Liability (Actuarial Value of Assets and in Millions)

Revised Demographic, 4.75% Average Salary Increase and 7.00% Interest Rate Assumption (Effective June 30, 2021 Valuation)



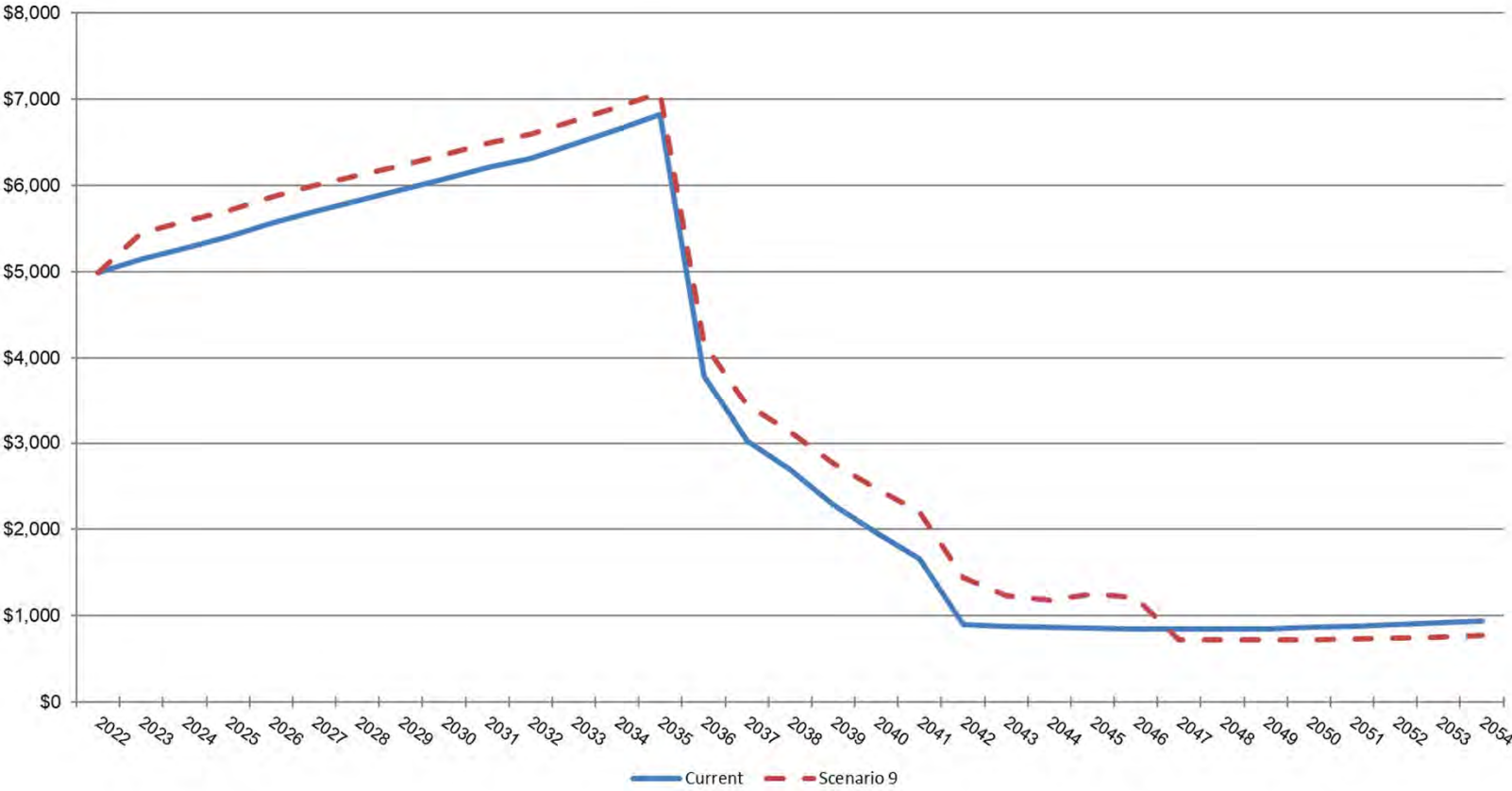
## Scenario 9 Assumptions - Projection of Contribution Rates and Funded Ratios As of June 30, 2020

### Revised Demographic, 4.75% Average Salary Increase and 6.875% Interest Rate Assumption (Effective June 30, 2021 Valuation)

Fiscal Year Ending June 30	Appropriation Payroll (\$Thousands)	DC Payroll (\$Thousands)			Fiscal Year Market Rate of Return	Member Contribution Rate	Employer Normal Cost	Employer Unfunded Liability Rate	Preliminary Employer Pension Rate	Health Care Contribution	Employer DC Contribution Rate			Total Employer Contribution Rate	Projected Total Employer Contribution (\$Thousands)	Funded Ratio	Unfunded Accrued Liability (Based on Actuarial Value of Assets & \$Millions)
		Class TG	Class TH	Class DC Only Participants							Class T-G 2.25% DC	Class T-H 2.00% DC	DC Only Participants 2.00% DC				
2019	\$ 13,775,000					7.57 %	7.59 %	25.01 %	32.60 %	0.83 %			33.43 %		58.1 %	\$ 44,134.2	
2020	13,880,000	\$ 389,350	\$ 179,700	\$ 29,950		7.59	7.49	25.87	33.36	0.84			34.29		<b>59.2</b>	<b>44,034.5</b>	
2021	14,078,000	720,583	332,577	55,429	20.00 %	7.61	7.37	26.14	33.51	0.82	0.12	0.05	0.01	34.51	\$ 4,858,318	57.6	48,907.7
<b>2022</b>	<b>14,289,000</b>	937,344	8,423	7,440	6.875	<b>7.56</b>	<b>7.20</b>	<b>26.79</b>	<b>33.99</b>	<b>0.80</b>	0.15	0.00	0.00	<b>34.94</b>	<b>4,992,577</b>	58.8	48,555.2
2023	14,399,686	1,444,285	13,712	12,778	6.875	7.48	7.02	29.80	36.82	0.82	0.23	0.00	0.00	37.87	5,453,161	60.5	47,506.2
2024	14,566,504	1,947,921	18,944	18,068	6.875	7.39	6.81	30.38	37.19	0.82	0.30	0.00	0.00	38.31	5,580,993	62.1	46,516.9
2025	14,742,751	2,434,352	23,991	23,169	6.875	7.32	6.59	30.95	37.54	0.81	0.37	0.00	0.00	38.72	5,708,373	64.0	45,009.1
2026	14,927,496	2,907,829	28,895	28,127	6.875	7.24	6.39	31.64	38.03	0.82	0.44	0.00	0.00	39.29	5,864,649	66.3	42,864.1
2027	15,114,855	3,379,212	33,767	33,052	6.875	7.17	6.18	32.21	38.39	0.80	0.50	0.00	0.00	39.69	5,998,678	68.7	40,497.0
2028	15,302,099	3,838,121	38,505	37,844	6.875	7.10	5.96	32.62	38.58	0.80	0.56	0.01	0.00	39.95	6,112,518	71.2	37,885.7
2029	15,486,039	4,291,379	43,184	42,570	6.875	7.04	5.74	33.08	38.82	0.80	0.62	0.01	0.01	40.26	6,234,303	73.8	34,930.1
2030	15,668,909	4,737,394	47,785	47,216	6.875	6.98	5.52	33.59	39.11	0.78	0.68	0.01	0.01	40.59	6,360,530	76.9	31,283.3
2031	15,847,181	5,192,054	52,428	51,840	6.875	6.92	5.30	34.11	39.41	0.78	0.74	0.01	0.01	40.95	6,488,882	79.6	27,944.5
2032	16,018,162	5,651,386	57,120	56,496	6.875	6.86	5.07	34.50	39.57	0.77	0.79	0.01	0.01	41.15	6,591,932	82.5	24,269.4
2033	16,175,600	6,112,690	61,834	61,168	6.875	6.80	4.84	35.24	40.08	0.77	0.85	0.01	0.01	41.72	6,748,794	85.6	20,184.1
2034	16,319,174	6,579,299	66,601	65,899	6.875	6.74	4.60	36.04	40.64	0.77	0.91	0.01	0.01	42.34	6,909,281	88.9	15,654.9
2035	16,454,837	7,054,843	71,457	70,723	6.875	6.68	4.36	36.88	41.24	0.77	0.96	0.01	0.01	42.99	7,074,099	92.5	10,647.4
2036	16,587,438	7,540,849	76,419	75,658	6.875	6.62	4.11	37.72	41.91	0.77	1.02	0.01	0.01	43.74	7,258,911	96.2	8,207.1
2037	16,716,345	8,036,376	81,474	80,687	6.875	6.55	3.86	38.64	42.64	0.77	1.08	0.01	0.01	44.61	7,464,512	99.6	6,311.1
2038	16,844,992	8,541,758	86,632	85,821	6.875	6.48	3.60	39.60	43.42	0.77	1.14	0.01	0.01	45.54	7,681,227	103.1	4,585.8
2039	16,972,171	9,057,782	91,894	91,067	6.875	6.41	3.34	40.64	44.24	0.77	1.20	0.01	0.01	46.51	7,908,944	106.6	3,099.4
2040	17,101,827	9,583,783	97,254	96,411	6.875	6.34	3.08	41.72	45.10	0.77	1.26	0.01	0.01	47.52	8,147,669	110.1	1,792.4
2041	17,235,591	10,119,585	102,711	101,861	6.875	6.26	2.82	42.84	46.00	0.77	1.32	0.01	0.01	48.56	8,397,451	113.5	644.1
2042	17,377,372	10,663,921	108,257	107,401	6.875	6.19	2.56	44.00	46.92	0.77	1.38	0.01	0.01	49.62	8,657,293	116.8	159.7
2043	17,532,448	11,216,944	113,893	113,041	6.875	6.11	2.31	45.24	47.88	0.77	1.44	0.01	0.01	50.76	8,927,195	120.0	(160.3)
2044	17,707,616	11,776,366	119,594	118,748	6.875	6.04	2.07	46.56	48.88	0.77	1.50	0.01	0.01	51.90	9,207,157	123.1	(462.0)
2045	17,909,460	12,340,247	125,345	124,504	6.875	5.97	1.85	47.92	49.92	0.77	1.55	0.01	0.01	53.04	9,497,179	126.1	(875.0)
2046	18,143,201	12,903,788	131,071	130,293	6.875	5.90	1.65	49.32	51.00	0.77	1.60	0.01	0.01	54.18	9,797,261	128.9	(1,289.1)
2047	18,417,213	13,469,570	136,827	136,103	6.875	5.83	1.48	50.76	52.12	0.77	1.65	0.01	0.01	55.32	10,107,303	131.5	(1,250.7)
2048	18,734,960	14,034,545	142,552	141,905	6.875	5.77	1.34	52.24	53.28	0.77	1.69	0.02	0.02	56.46	10,427,305	133.9	(1,199.7)
2049	19,105,996	14,604,068	148,339	147,759	6.875	5.72	1.23	53.76	54.48	0.77	1.72	0.02	0.02	57.60	10,757,267	136.1	(1,137.8)
2050	19,527,717	15,179,629	154,186	153,678	6.875	5.67	1.14	55.32	55.72	0.77	1.75	0.02	0.02	58.74	11,097,189	138.1	(1,065.7)
2051	19,992,947	15,762,637	160,122	159,678	6.875	5.63	1.07	56.92	57.00	0.77	1.77	0.02	0.02	59.88	11,447,071	140.0	(985.5)
2052	20,499,446	16,357,545	166,178	165,813	6.875	5.60	1.01	58.56	58.04	0.77	1.80	0.02	0.02	61.02	11,806,913	141.7	(600.9)
2053	21,042,922	16,954,717	172,275	171,966	6.875	5.57	0.97	60.24	59.00	0.77	1.81	0.02	0.02	62.16	12,176,715	143.2	(227.3)
2054	21,614,266	17,547,000	178,330	178,086	6.875	5.55	0.93	62.00	59.72	0.77	1.83	0.02	0.02	63.29	12,556,477	144.5	115.0
<b>Total</b>														121,370,574			

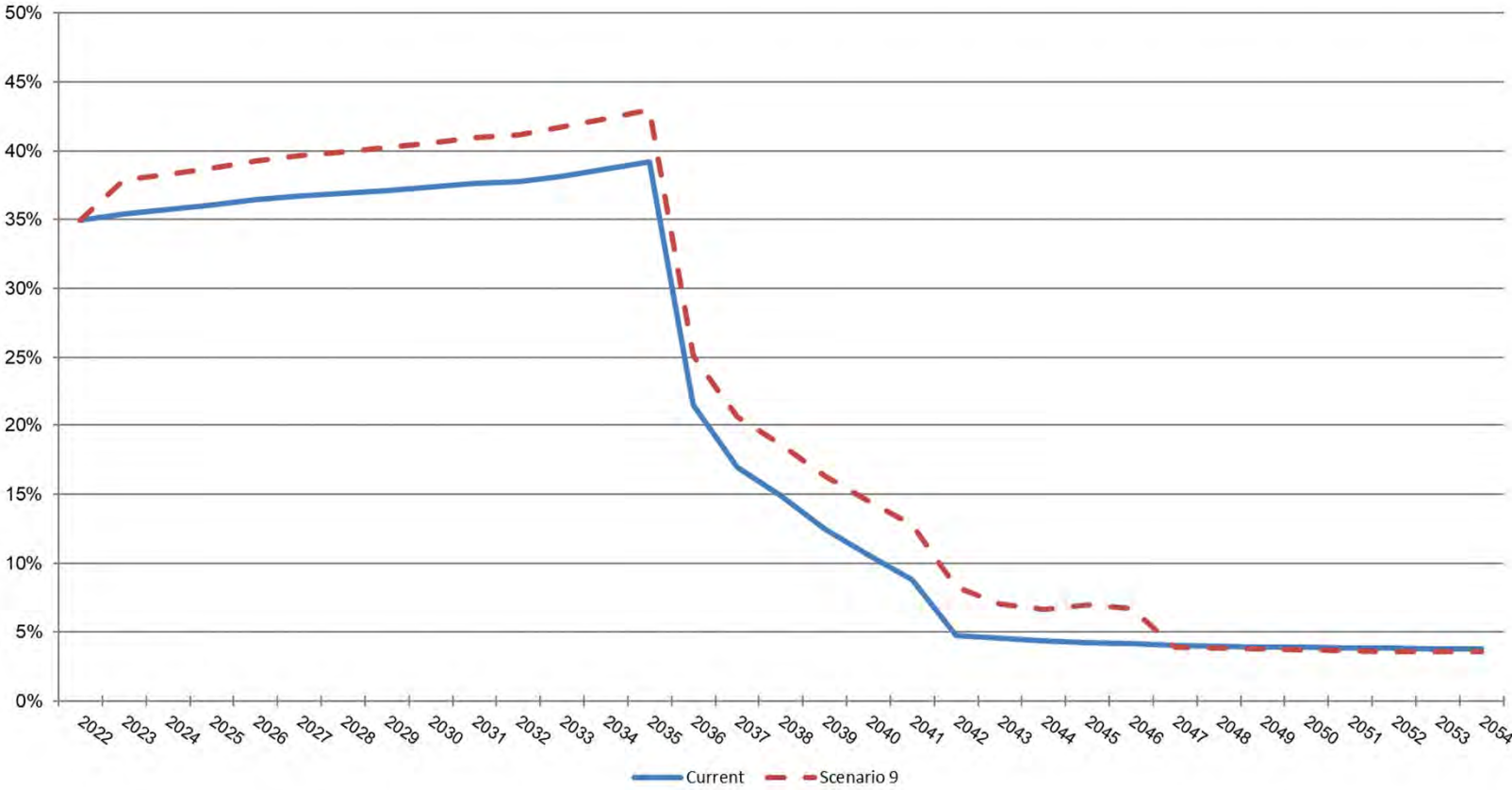
Note: Assumes an investment return of 20.00% for fiscal year ending 6/30/2021 and 6.875% per year thereafter.

**Scenario 9 Assumptions - Comparison of Projected System Employer Contribution Amounts (Millions)**  
 Revised Demographic, 4.75% Average Salary Increase and 6.875% Interest Rate Assumption (Effective June 30, 2021 Valuation)

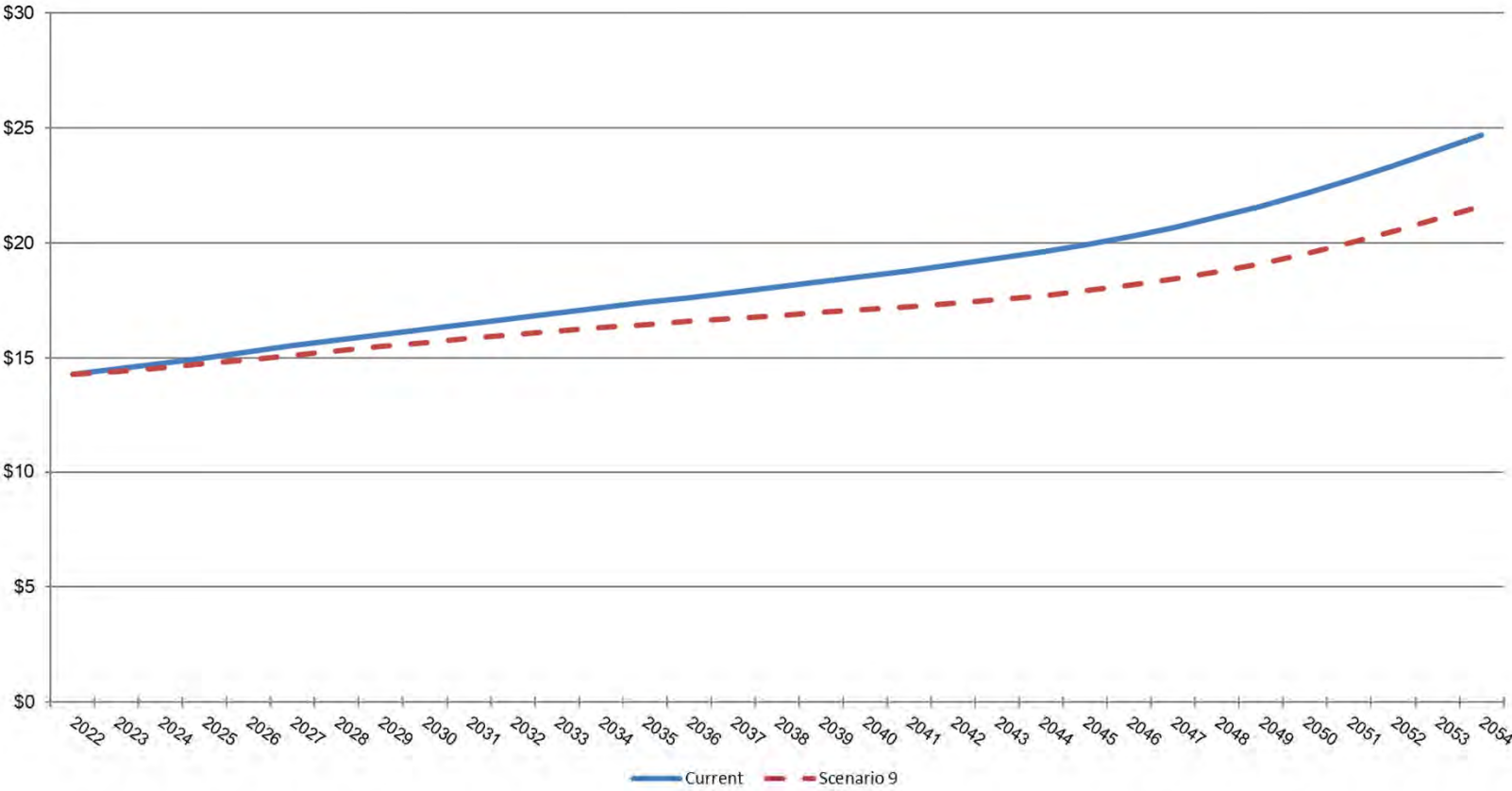




**Scenario 9 Assumptions - Comparison of Projected System Employer Contribution Rates**  
 Revised Demographic, 4.75% Average Salary Increase and 6.875% Interest Rate Assumption (Effective June 30, 2021 Valuation)

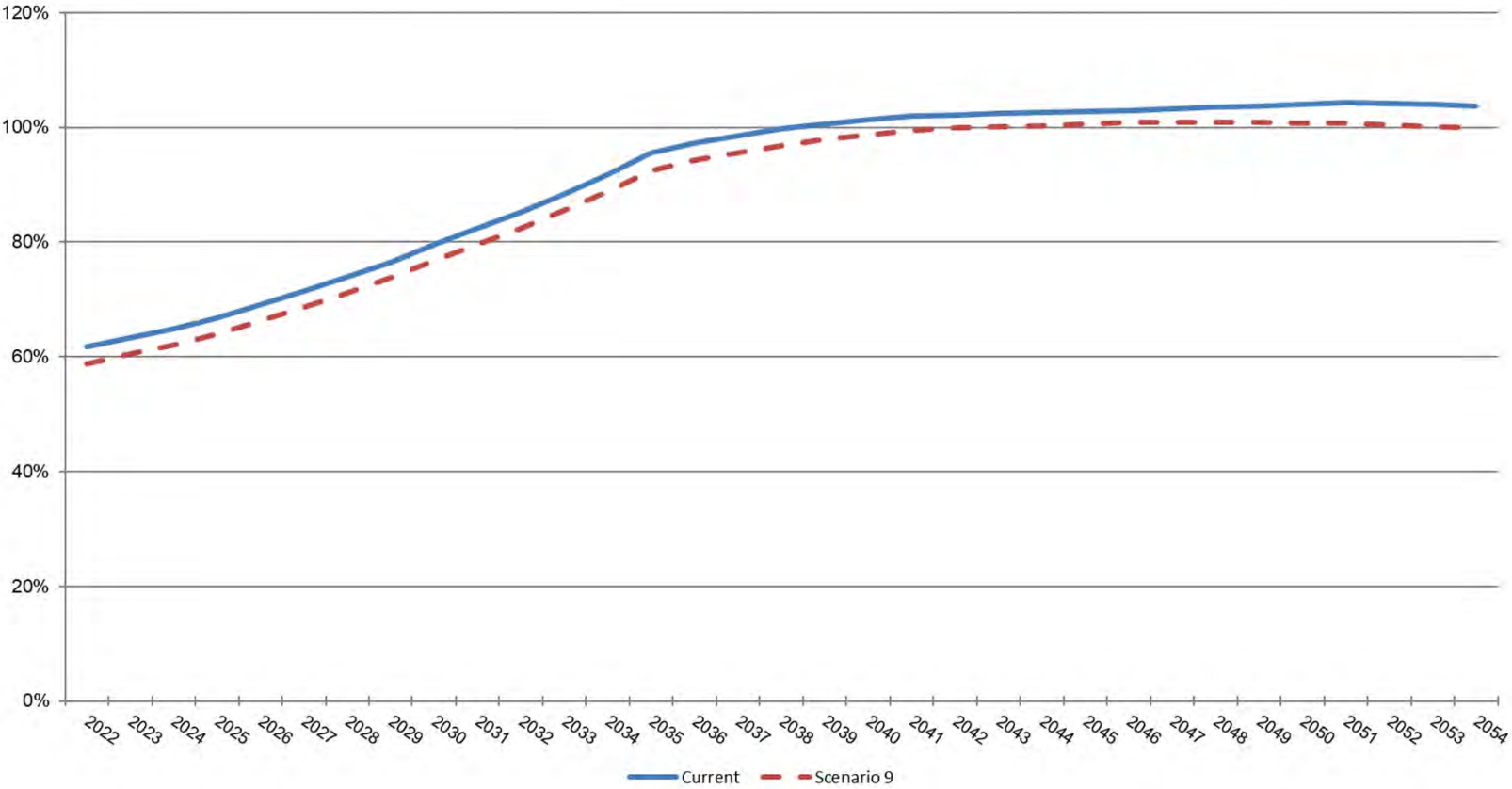


**Scenario 9 Assumptions - Comparison of Projected System Appropriation Payroll (Billions)**  
 Revised Demographic, 4.75% Average Salary Increase and 6.875% Interest Rate Assumption (Effective June 30, 2021 Valuation)

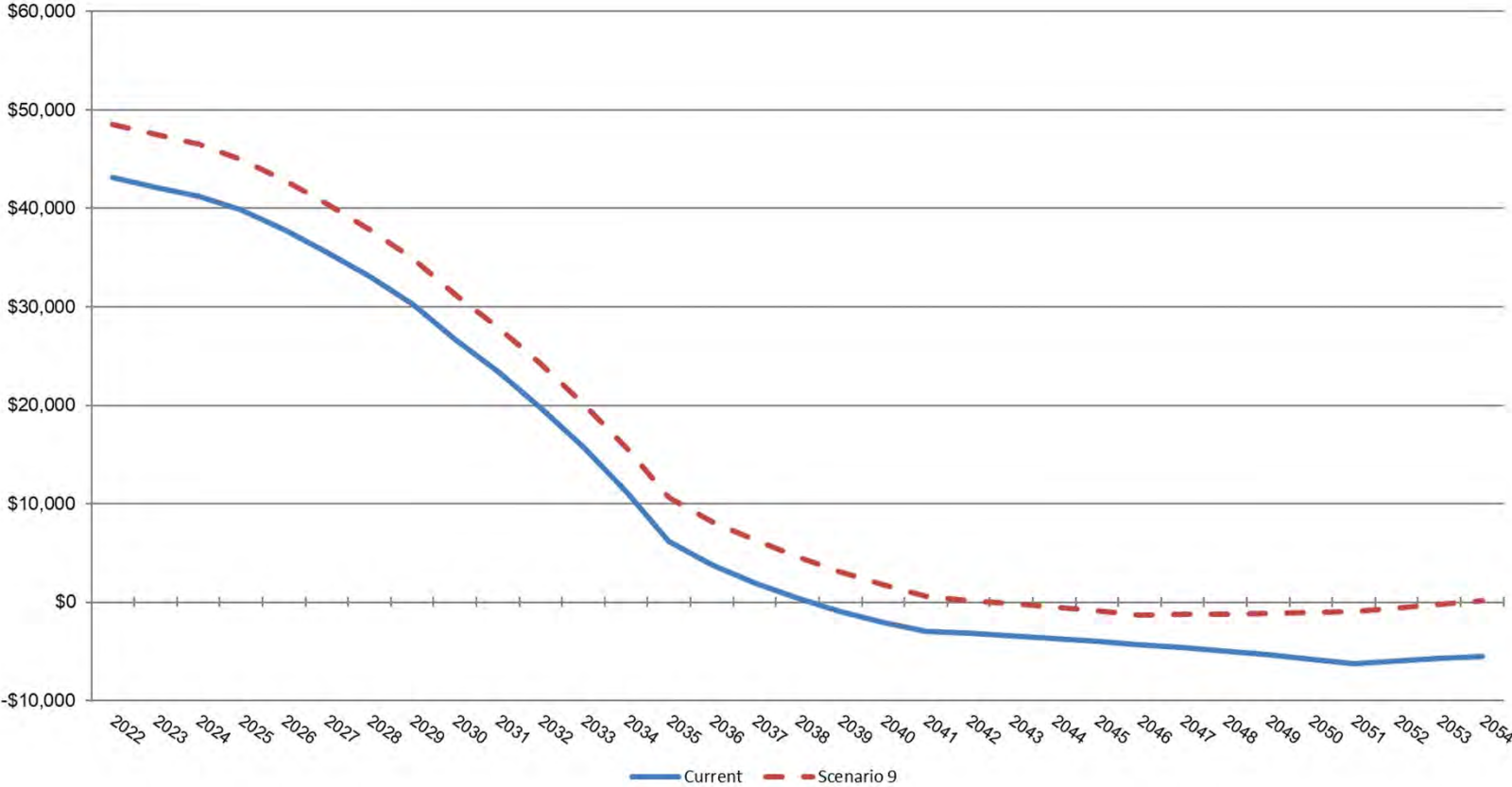


Note: Current assumes a 3.50% annual payroll growth while Scenario 9 assumes a 3.25% annual payroll growth.

**Scenario 9 Assumptions - Comparison of Projected System Funded Ratio (Actuarial Value of Assets)**  
 Revised Demographic, 4.75% Average Salary Increase and 6.875% Interest Rate Assumption (Effective June 30, 2021 Valuation)



**Scenario 9 Assumptions - Comparison of Projected System Unfunded Accrued Liability  
(Actuarial Value of Assets and in Millions)**  
 Revised Demographic, 4.75% Average Salary Increase and 6.875% Interest Rate Assumption (Effective June 30, 2021 Valuation)



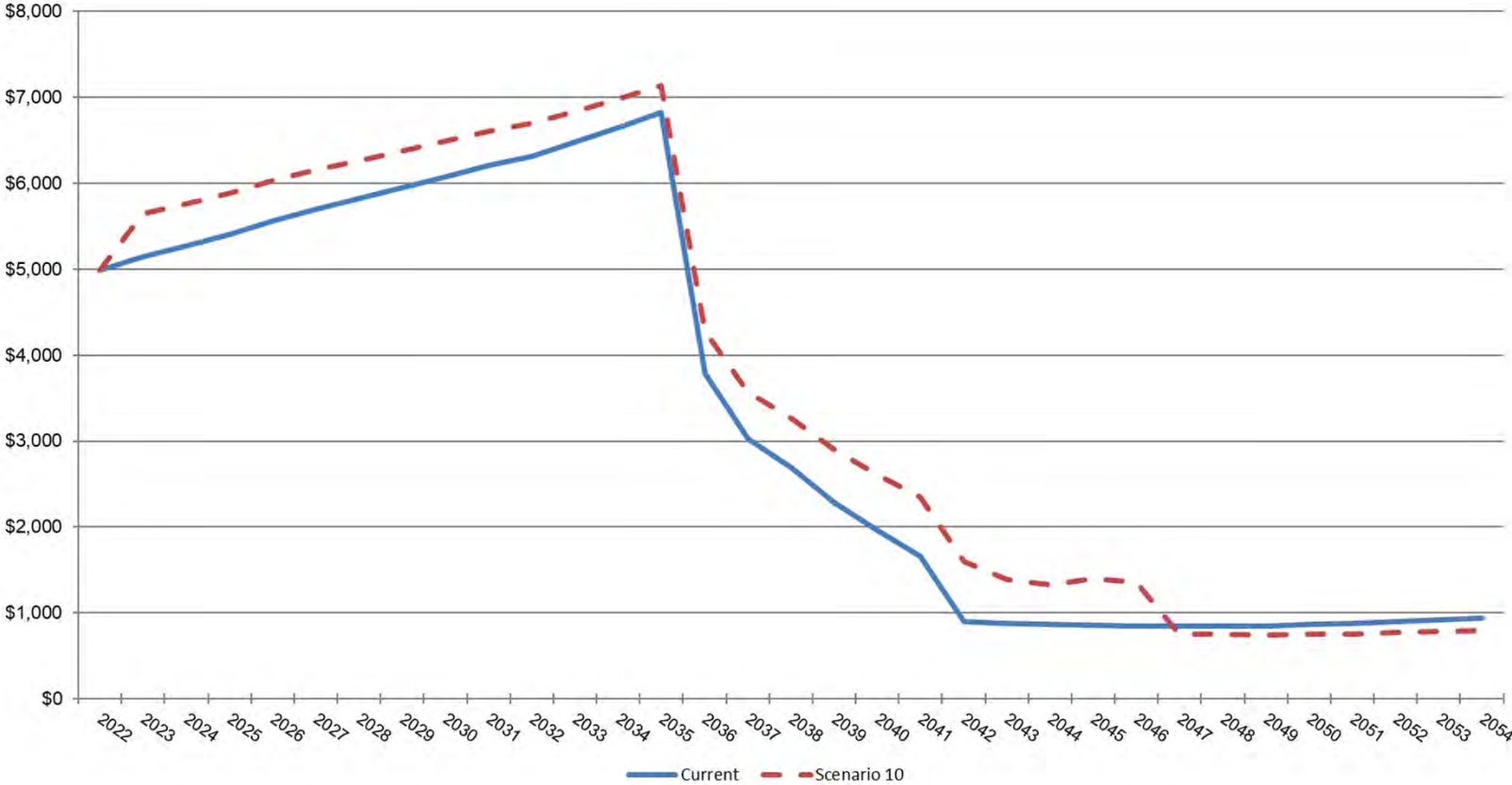
## Scenario 10 Assumptions - Projection of Contribution Rates and Funded Ratios As of June 30, 2020

Revised Demographic, 4.75% Average Salary Increase and 6.75% Interest Rate Assumption (Effective June 30, 2021 Valuation)

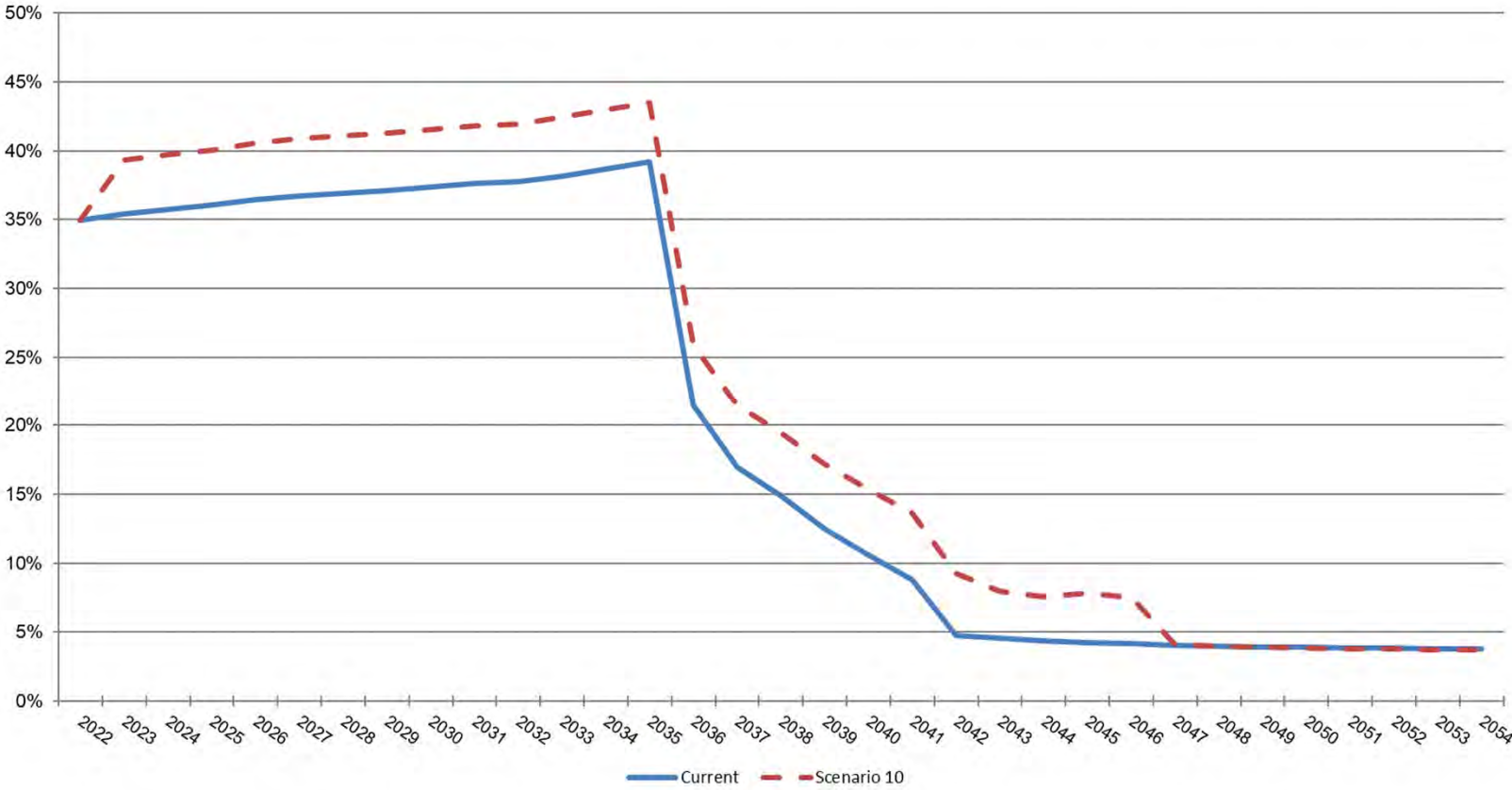
Fiscal Year Ending June 30	Appropriation Payroll (\$Thousands)	DC Payroll (\$Thousands)			Fiscal Year Market Rate of Return	Member Contribution Rate	Employer Normal Cost	Employer Unfunded Liability Rate	Preliminary Employer Pension Rate	Health Care Contribution	Employer DC Contribution Rate			Total Employer Contribution Rate	Projected Total Employer Contribution (\$Thousands)	Funded Ratio	Unfunded Accrued Liability (Based on Actuarial Value of Assets & \$Millions)
		Class TG	Class TH	Class DC Only Participants							Class T-G 2.25% DC	Class T-H 2.00% DC	DC Only Participants 2.00% DC				
2019	\$ 13,775,000					7.57 %	7.59 %	25.01 %	32.60 %	0.83 %			33.43 %		58.1 %	\$ 44,134.2	
2020	13,880,000	\$ 389,350	\$ 179,700	\$ 29,950		7.59	7.49	25.87	33.36	0.84			34.29		<b>59.2</b>	<b>44,034.5</b>	
2021	14,078,000	720,583	332,577	55,429	20.00 %	7.61	7.37	26.14	33.51	0.82	0.12	0.05	0.01	34.51	\$ 4,858,318	56.9	50,438.3
<b>2022</b>	<b>14,289,000</b>	937,344	8,423	7,440	6.750	<b>7.56</b>	<b>7.20</b>	<b>26.79</b>	<b>33.99</b>	<b>0.80</b>	0.15	0.00	0.00	<b>34.94</b>	<b>4,992,577</b>	58.0	50,182.6
2023	14,347,419	1,439,043	13,662	12,732	6.750	7.48	7.41	30.86	38.27	0.82	0.23	0.00	0.00	39.32	5,641,405	59.8	49,047.2
2024	14,513,631	1,940,851	18,875	18,003	6.750	7.39	7.20	31.39	38.59	0.82	0.30	0.00	0.00	39.71	5,762,847	61.4	47,973.9
2025	14,689,238	2,425,516	23,904	23,085	6.750	7.32	6.98	31.89	38.87	0.82	0.37	0.00	0.00	40.06	5,885,202	63.4	46,385.3
2026	14,873,313	2,897,274	28,790	28,025	6.750	7.24	6.77	32.52	39.29	0.82	0.44	0.00	0.00	40.55	6,031,688	65.7	44,163.9
2027	15,059,992	3,366,946	33,644	32,932	6.750	7.17	6.54	33.03	39.57	0.80	0.50	0.00	0.00	40.87	6,155,091	68.1	41,726.5
2028	15,246,556	3,824,189	38,365	37,707	6.750	7.10	6.32	33.37	39.69	0.81	0.56	0.01	0.00	41.07	6,261,934	70.6	39,052.9
2029	15,429,828	4,275,802	43,028	42,416	6.750	7.04	6.09	33.76	39.85	0.80	0.62	0.01	0.01	41.29	6,371,609	73.3	36,044.0
2030	15,612,034	4,720,198	47,611	47,045	6.750	6.98	5.86	34.21	40.07	0.78	0.68	0.01	0.01	41.55	6,486,688	76.3	32,354.5
2031	15,789,659	5,173,208	52,237	51,652	6.750	6.92	5.63	34.65	40.28	0.78	0.74	0.01	0.01	41.82	6,603,145	79.1	28,985.9
2032	15,960,020	5,630,873	56,913	56,291	6.750	6.86	5.40	34.97	40.37	0.78	0.79	0.01	0.01	41.96	6,696,550	81.9	25,294.9
2033	16,116,886	6,090,502	61,609	60,946	6.750	6.80	5.16	35.63	40.79	0.78	0.85	0.01	0.01	42.44	6,840,360	85.0	21,209.2
2034	16,259,940	6,555,418	66,359	65,660	6.750	6.74	4.91	36.35	41.26	0.78	0.91	0.01	0.01	42.97	6,986,938	88.3	16,697.2
2035	16,395,110	7,029,236	71,197	70,466	6.750	6.68	4.66	37.11	41.77	0.78	0.96	0.01	0.01	43.53	7,136,968	91.9	11,663.4
2036	16,527,230	7,513,477	76,141	75,383	6.750	6.61	4.40	37.99	42.49	0.78	1.02	0.01	0.01	44.19	7,291,038	95.7	9,132.2
2037	16,655,668	8,007,205	81,179	80,394	6.750	6.55	4.13	38.94	43.44	0.78	1.08	0.01	0.01	44.94	7,454,263	99.1	7,125.2
2038	16,783,848	8,510,753	86,317	85,509	6.750	6.48	3.86	40.06	44.64	0.78	1.14	0.01	0.01	45.74	7,626,511	102.5	5,276.0
2039	16,910,566	9,024,905	91,560	90,736	6.750	6.41	3.59	41.43	46.09	0.78	1.20	0.01	0.01	46.64	7,807,824	106.0	3,648.7
2040	17,039,751	9,548,996	96,901	96,061	6.750	6.34	3.32	43.07	47.78	0.78	1.26	0.01	0.01	47.64	8,000,029	109.5	2,184.0
2041	17,173,030	10,082,853	102,338	101,491	6.750	6.26	3.05	44.94	49.84	0.78	1.32	0.01	0.01	48.56	8,213,111	113.0	859.6
2042	17,314,296	10,625,214	107,864	107,011	6.750	6.19	2.77	47.07	52.64	0.78	1.38	0.01	0.01	49.26	8,446,746	116.5	160.6
2043	17,468,810	11,176,230	113,479	112,630	6.750	6.11	2.51	49.49	56.32	0.78	1.44	0.01	0.01	50.04	8,702,352	120.0	(397.8)
2044	17,643,342	11,733,621	119,160	118,316	6.750	6.04	2.26	52.28	60.60	0.78	1.50	0.01	0.01	50.94	9,000,000	123.5	(957.5)
2045	17,844,453	12,295,455	124,890	124,052	6.750	5.97	2.02	56.46	65.54	0.78	1.55	0.01	0.01	51.94	9,352,880	127.0	(1,643.9)
2046	18,077,346	12,866,951	130,596	129,820	6.750	5.90	1.82	61.64	71.64	0.78	1.60	0.01	0.01	53.04	9,768,436	130.5	(2,351.9)
2047	18,350,363	13,420,679	136,330	135,609	6.750	5.83	1.64	(1.97)	(0.33)	0.78	1.65	0.01	0.01	54.24	10,250,530	134.0	(2,525.3)
2048	18,666,957	13,983,603	142,035	141,390	6.750	5.77	1.50	(1.95)	(0.45)	0.78	1.69	0.02	0.02	55.54	10,808,545	137.5	(2,707.3)
2049	19,036,645	14,551,058	147,800	147,223	6.750	5.72	1.37	(2.03)	(0.66)	0.78	1.72	0.02	0.02	56.94	11,448,333	141.0	(2,901.3)
2050	19,456,837	15,124,532	153,626	153,120	6.750	5.67	1.28	(2.31)	(1.03)	0.78	1.75	0.02	0.02	58.44	12,188,088	144.5	(3,109.4)
2051	19,920,377	15,705,422	159,541	159,099	6.750	5.63	1.21	(2.38)	(1.17)	0.78	1.77	0.02	0.02	59.94	13,048,974	148.0	(3,335.3)
2052	20,425,038	16,298,171	165,575	165,211	6.750	5.60	1.15	(2.19)	(1.04)	0.78	1.80	0.02	0.02	61.44	14,048,024	151.5	(3,111.3)
2053	20,966,542	16,893,176	171,649	171,342	6.750	5.57	1.10	(2.07)	(0.97)	0.78	1.81	0.02	0.02	62.94	15,198,052	155.0	(2,887.2)
2054	21,535,811	17,483,308	177,683	177,440	6.750	5.55	1.06	(1.83)	(0.77)	0.78	1.83	0.02	0.02	64.44	16,498,979	158.5	(2,691.8)
<b>Total</b>														124,867,797			

Note: Assumes an investment return of 20.00% for fiscal year ending 6/30/2021 and 6.75% per year thereafter.

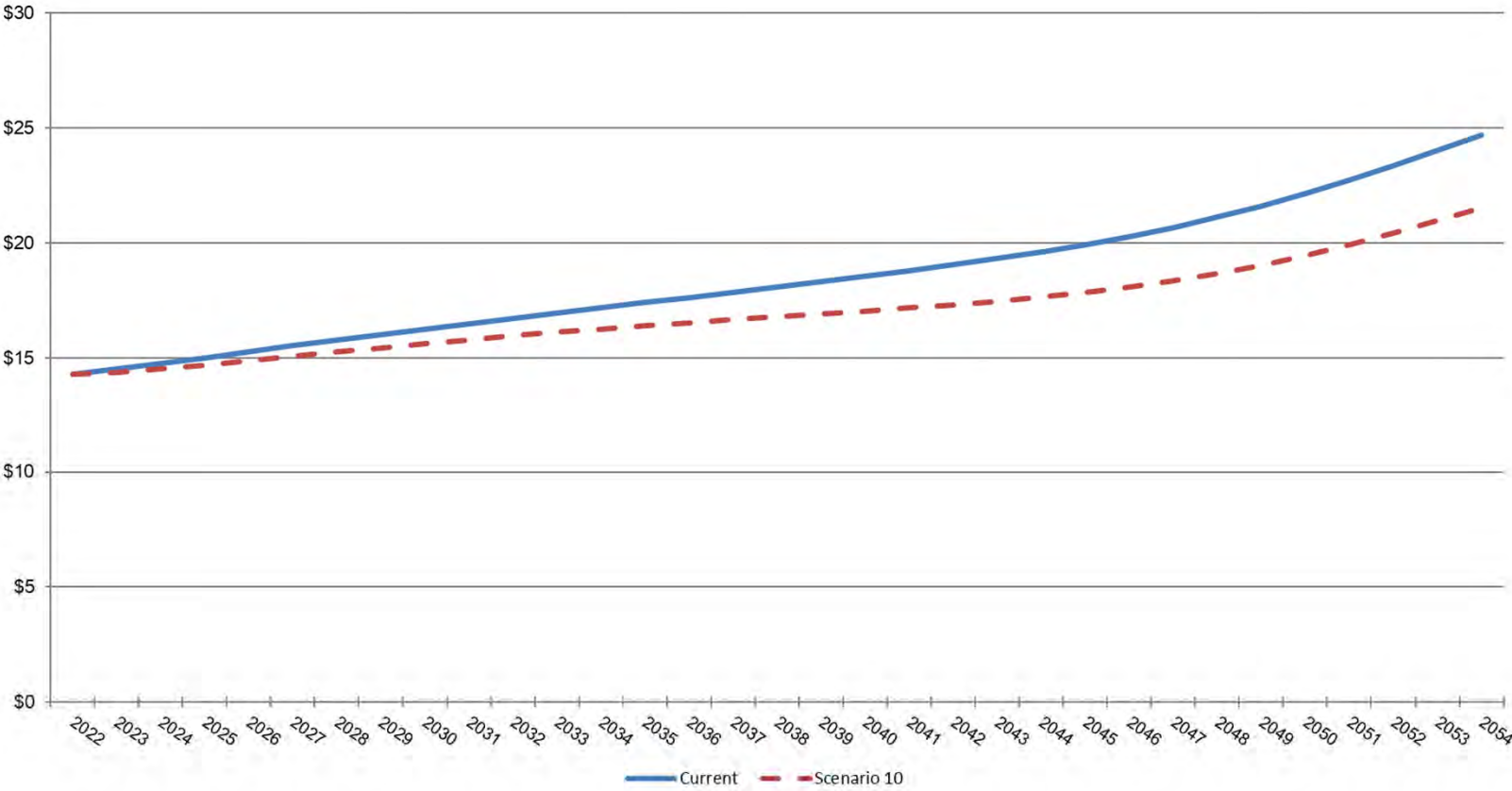
**Scenario 10 Assumptions - Comparison of Projected System Employer Contribution Amounts (Millions)**  
 Revised Demographic, 4.75% Average Salary Increase and 6.75% Interest Rate Assumption (Effective June 30, 2021 Valuation)



**Scenario 10 Assumptions - Comparison of Projected System Employer Contribution Rates**  
 Revised Demographic, 4.75% Average Salary Increase and 6.75% Interest Rate Assumption (Effective June 30, 2021 Valuation)



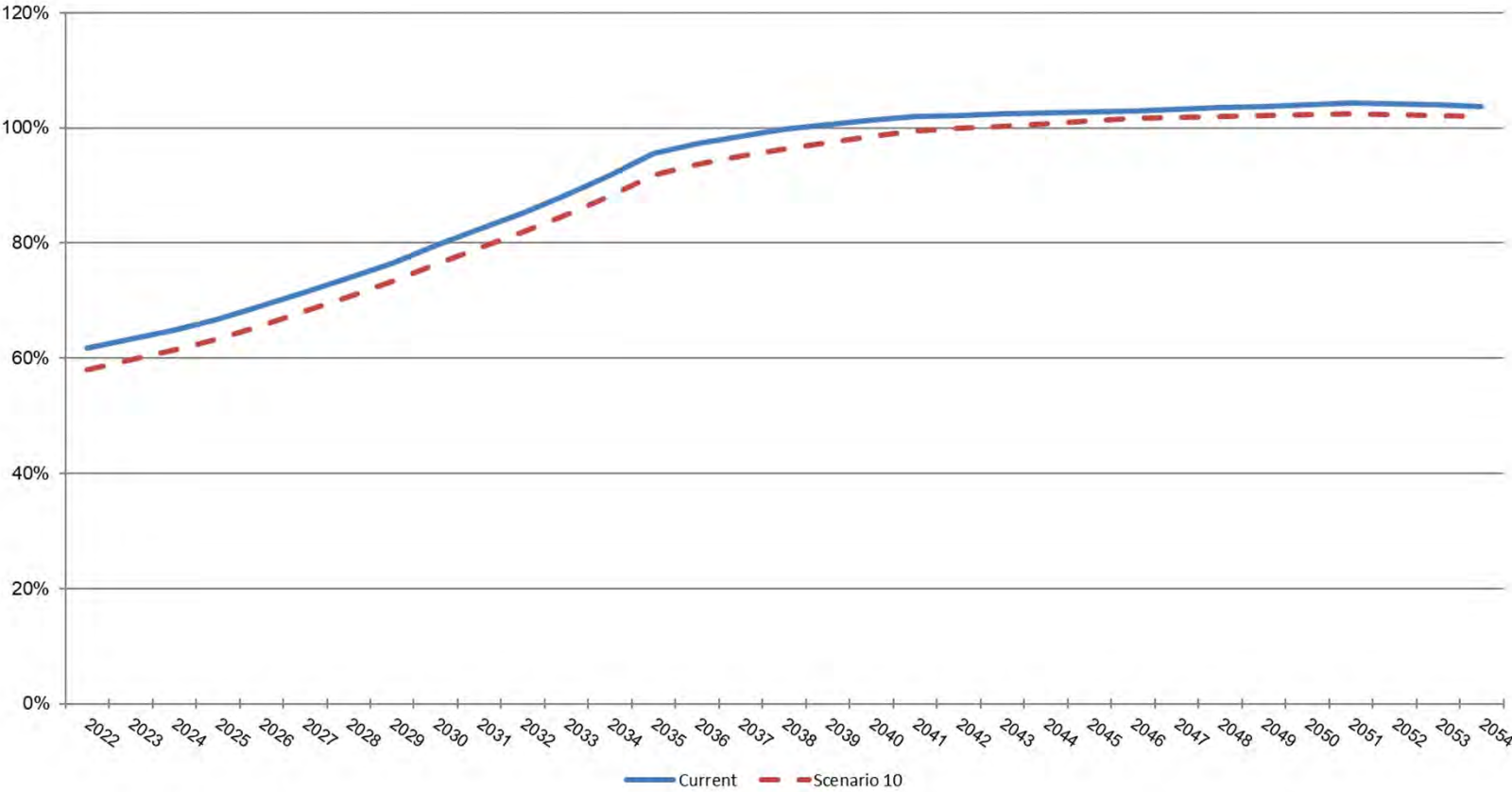
**Scenario 10 Assumptions - Comparison of Projected System Appropriation Payroll (Billions)**  
 Revised Demographic, 4.75% Average Salary Increase and 6.75% Interest Rate Assumption (Effective June 30, 2021 Valuation)



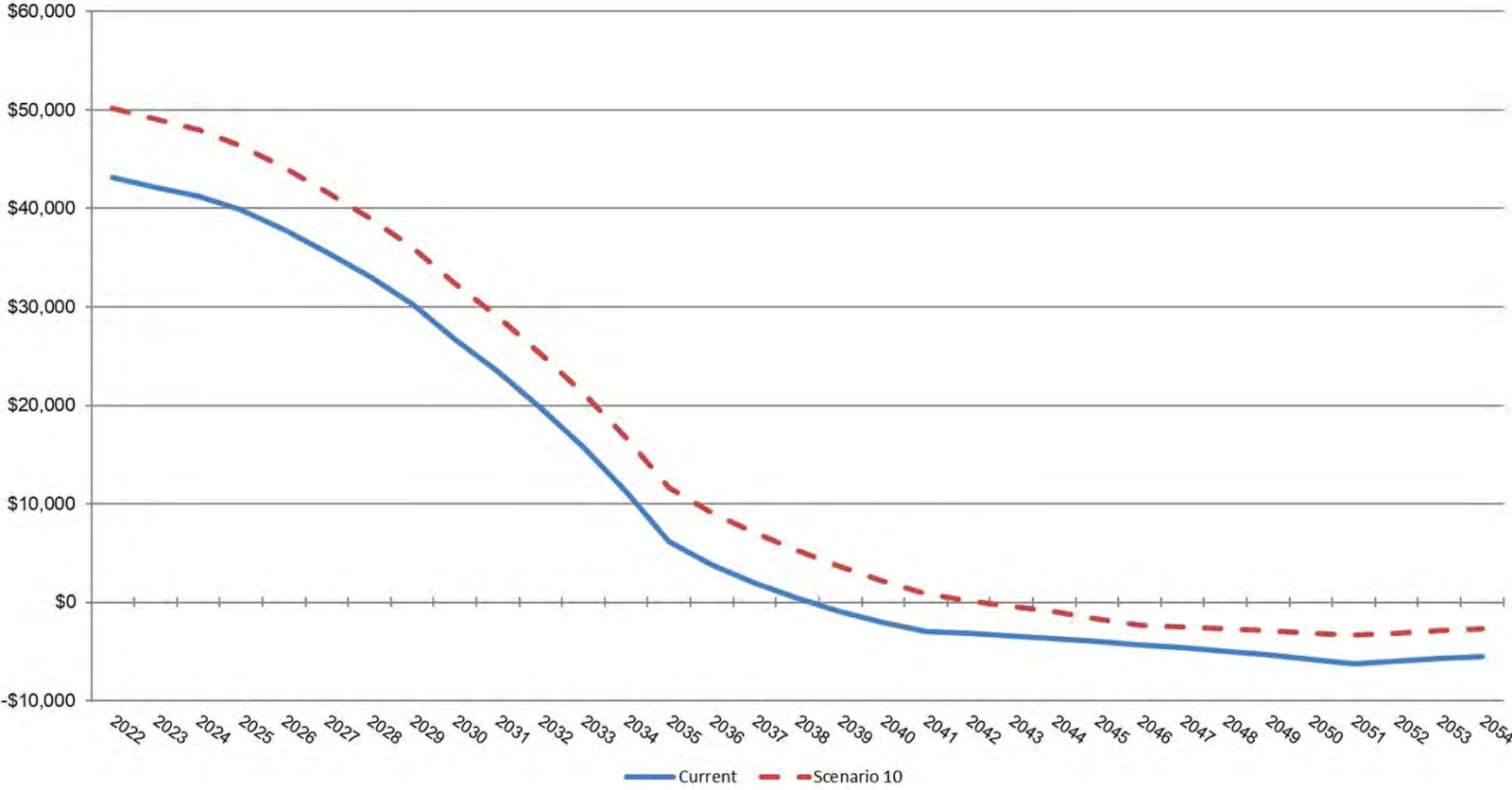
Note: Current assumes a 3.50% annual payroll growth while Scenario 10 assumes a 3.00% annual payroll growth.



**Scenario 10 Assumptions - Comparison of Projected System Funded Ratio (Actuarial Value of Assets)**  
 Revised Demographic, 4.75% Average Salary Increase and 6.75% Interest Rate Assumption (Effective June 30, 2021 Valuation)



**Scenario 10 Assumptions - Comparison of Projected System Unfunded Accrued Liability  
(Actuarial Value of Assets and in Millions)**  
 Revised Demographic, 4.75% Average Salary Increase and 6.75% Interest Rate Assumption (Effective June 30, 2021 Valuation)



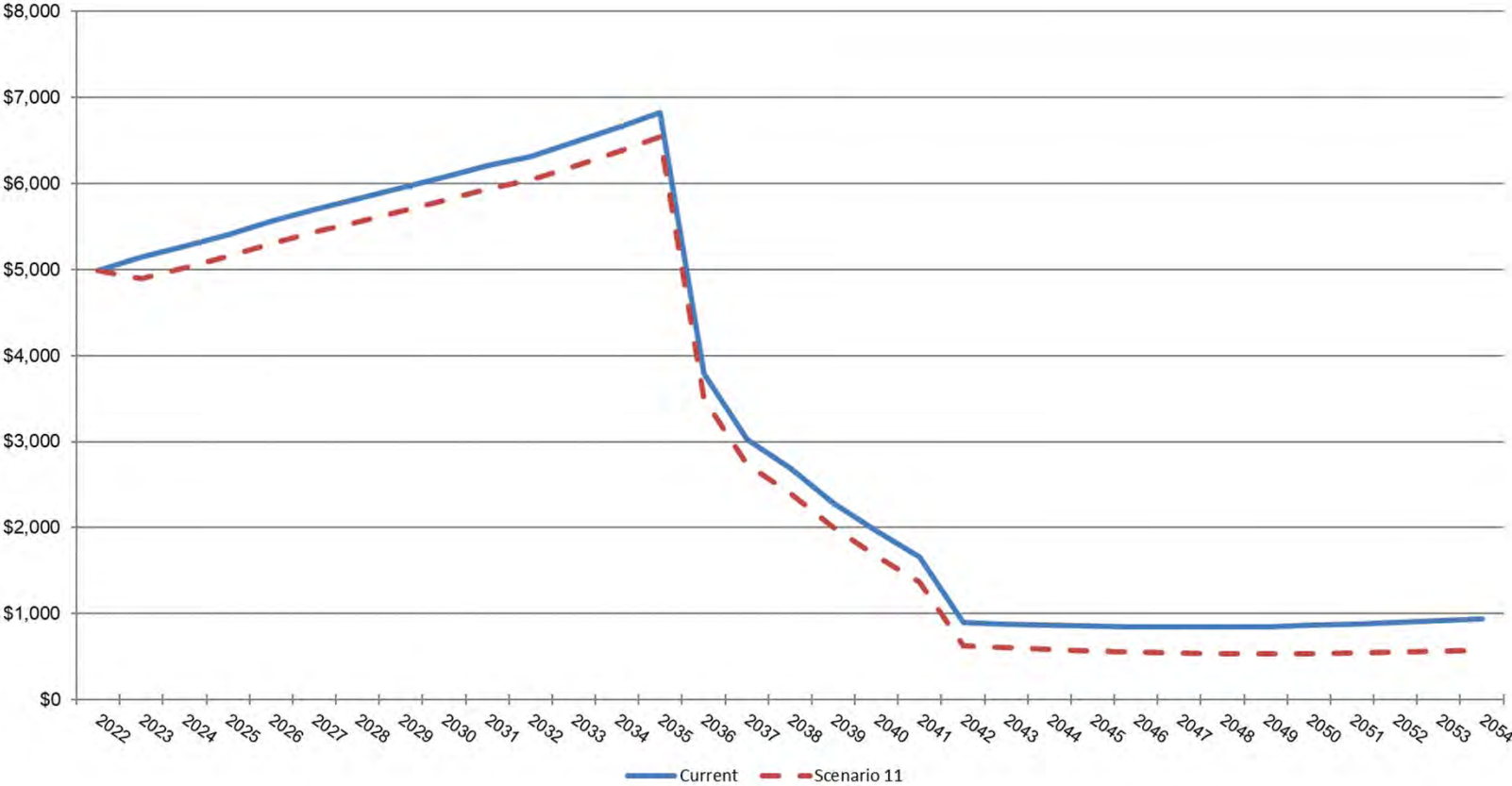
## Scenario 11 Assumptions - Projection of Contribution Rates and Funded Ratios As of June 30, 2020

### Revised Demographic, 4.50% Average Salary Increase and 7.25% Interest Rate Assumption (Effective June 30, 2021 Valuation)

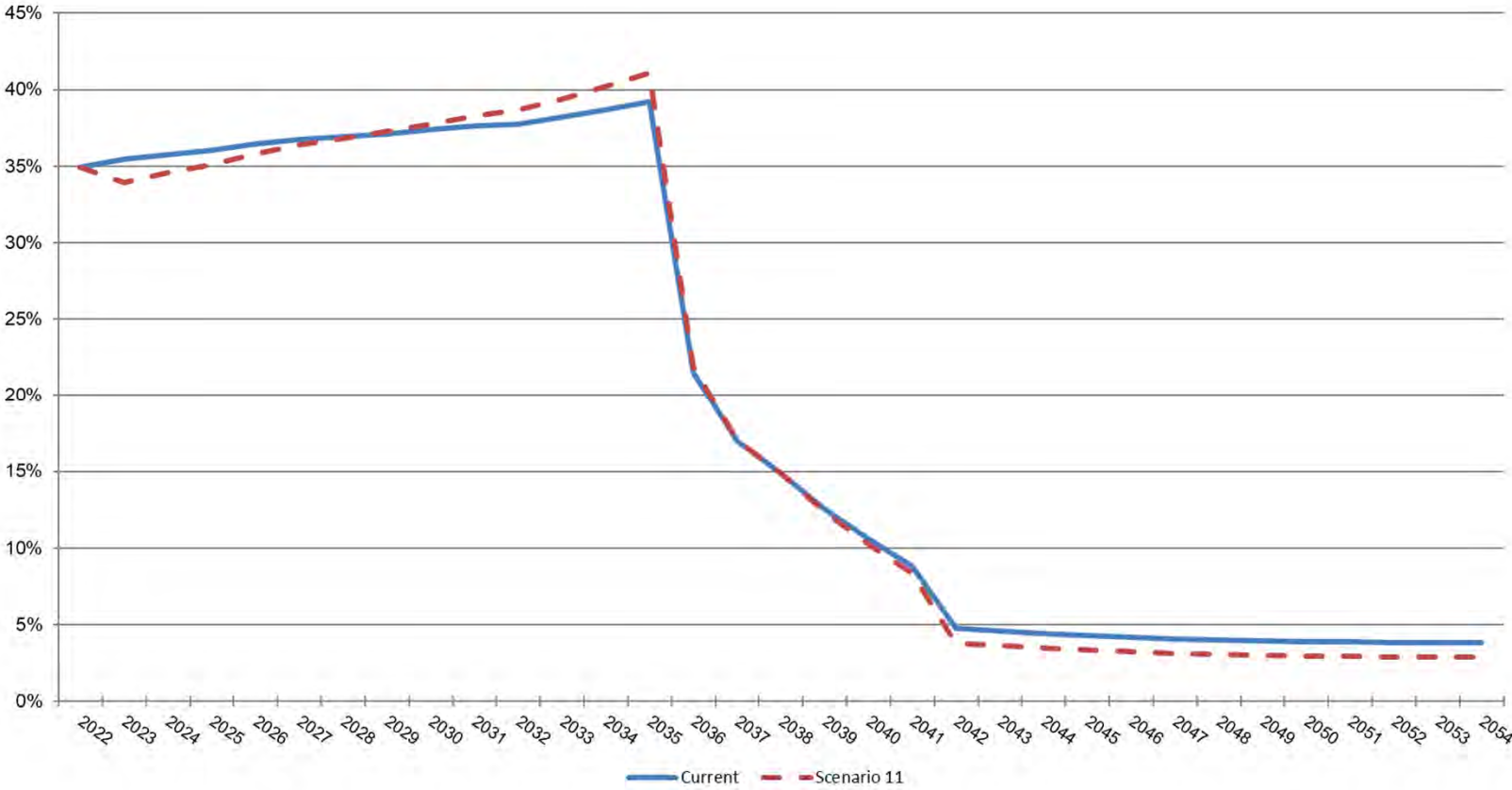
Fiscal Year Ending June 30	Appropriation Payroll (\$Thousands)	DC Payroll (\$Thousands)			Fiscal Year Market Rate of Return	Member Contribution Rate	Employer Normal Cost	Employer Unfunded Liability Rate	Preliminary Employer Pension Rate	Health Care Contribution	Employer DC Contribution Rate			Total Employer Contribution Rate	Projected Total Employer Contribution (\$Thousands)	Funded Ratio	Unfunded Accrued Liability (Based on Actuarial Value of Assets & \$Millions)
		Class TG	Class TH	Class DC Only Participants							Class T-G 2.25% DC	Class T-H 2.00% DC	DC Only Participants 2.00% DC				
2019	\$ 13,775,000					7.57 %	7.59 %	25.01 %	32.60 %	0.83 %			33.43 %				\$ 44,134.2
2020	13,880,000	\$ 389,350	\$ 179,700	\$ 29,950		7.59	7.49	25.87	33.36	0.84	0.06 %	0.03 %	0.00 %	34.29		59.2	44,034.5
2021	14,078,000	720,583	332,577	55,429	20.00 %	7.61	7.37	26.14	33.51	0.82	0.12	0.05	0.01	34.51	\$ 4,858,318	60.3	43,745.7
<b>2022</b>	<b>14,289,000</b>	937,344	8,423	7,440	7.25	<b>7.56</b>	<b>7.20</b>	<b>26.79</b>	<b>33.99</b>	<b>0.80</b>	0.15	0.00	0.00	<b>34.94</b>	<b>4,992,577</b>	61.8	43,038.3
2023	14,410,212	1,437,727	13,650	12,721	7.25	7.48	5.34	27.59	32.93	0.81	0.22	0.00	0.00	33.96	4,893,708	63.4	42,084.3
2024	14,535,091	1,928,352	18,754	17,889	7.25	7.39	5.17	28.28	33.45	0.82	0.30	0.00	0.00	34.57	5,025,206	64.8	41,192.4
2025	14,668,617	2,396,601	23,619	22,812	7.25	7.32	4.98	28.96	33.94	0.82	0.37	0.00	0.00	35.13	5,152,801	66.6	39,784.4
2026	14,809,835	2,847,001	28,291	27,542	7.25	7.24	4.81	29.76	34.57	0.82	0.43	0.00	0.00	35.82	5,305,464	68.8	37,739.3
2027	14,952,919	3,290,426	32,881	32,187	7.25	7.17	4.63	30.45	35.08	0.81	0.50	0.00	0.00	36.39	5,441,975	71.2	35,469.7
2028	15,095,198	3,716,920	37,290	36,653	7.25	7.10	4.45	30.98	35.43	0.81	0.55	0.00	0.00	36.79	5,553,789	73.6	32,953.0
2029	15,233,533	4,133,321	41,595	41,006	7.25	7.04	4.26	31.57	35.83	0.81	0.61	0.01	0.01	37.27	5,677,121	76.2	30,087.5
2030	15,370,158	4,538,264	45,777	45,236	7.25	6.98	4.08	32.21	36.29	0.79	0.66	0.01	0.01	37.76	5,804,049	79.3	26,524.5
2031	15,501,669	4,947,037	49,955	49,398	7.25	6.92	3.89	32.86	36.75	0.80	0.72	0.01	0.01	38.29	5,935,102	82.0	23,260.3
2032	15,625,531	5,355,872	54,135	53,546	7.25	6.86	3.70	33.38	37.08	0.79	0.77	0.01	0.01	38.66	6,041,212	85.0	19,652.0
2033	15,735,830	5,762,264	58,291	57,667	7.25	6.80	3.51	34.27	37.78	0.79	0.82	0.01	0.01	39.41	6,201,091	88.2	15,622.7
2034	15,832,430	6,169,350	62,453	61,799	7.25	6.74	3.32	35.22	38.54	0.79	0.88	0.01	0.01	40.23	6,368,776	91.6	11,136.2
2035	15,921,212	6,580,460	66,654	65,974	7.25	6.68	3.11	36.22	39.33	0.79	0.93	0.01	0.01	41.07	6,538,626	95.4	6,091.1
2036	16,006,925	6,996,948	70,909	70,208	7.25	6.61	2.91	37.16	40.17	0.79	0.98	0.01	0.01	41.92	6,718,582	97.2	3,712.8
2037	16,089,022	7,417,873	75,206	74,484	7.25	6.55	2.70	38.11	41.07	0.79	1.04	0.01	0.01	42.84	6,908,089	98.6	1,917.6
2038	16,170,826	7,843,478	79,552	78,813	7.25	6.48	2.49	39.14	42.03	0.79	1.09	0.01	0.01	43.81	7,108,532	99.8	322.4
2039	16,251,211	8,274,423	83,949	83,200	7.25	6.41	2.28	40.26	43.07	0.79	1.15	0.01	0.01	44.84	7,319,801	100.7	(996.7)
2040	16,333,934	8,710,019	88,390	87,630	7.25	6.33	2.07	41.43	44.20	0.79	1.20	0.01	0.01	45.92	7,542,538	101.6	(2,096.1)
2041	16,420,521	9,150,042	92,874	92,111	7.25	6.26	1.86	42.64	45.42	0.79	1.25	0.01	0.01	47.07	7,777,352	102.2	(2,992.5)
2042	16,514,642	9,593,267	97,392	96,628	7.25	6.18	1.65	(0.48)	46.75	0.79	1.31	0.01	0.01	48.32	8,024,602	102.4	(3,226.3)
2043	16,621,186	10,039,744	101,944	101,188	7.25	6.11	1.45	(1.87)	48.10	0.79	1.36	0.01	0.01	49.66	8,292,687	102.6	(3,482.4)
2044	16,746,406	10,487,321	106,508	105,760	7.25	6.04	1.25	(3.30)	49.54	0.79	1.41	0.01	0.01	51.09	8,576,100	102.9	(3,757.0)
2045	16,896,266	10,934,195	111,068	110,330	7.25	5.96	1.08	(4.84)	51.07	0.79	1.46	0.01	0.01	52.60	8,874,025	103.1	(4,047.7)
2046	17,075,415	11,376,095	115,559	114,879	7.25	5.89	0.93	(6.47)	52.69	0.79	1.50	0.01	0.01	54.20	9,187,243	103.4	(4,361.0)
2047	17,291,388	11,815,210	120,027	119,398	7.25	5.83	0.79	(8.20)	54.42	0.79	1.54	0.01	0.01	55.94	9,512,950	103.7	(4,698.4)
2048	17,547,040	12,248,800	124,420	123,861	7.25	5.77	0.68	(10.14)	56.28	0.79	1.57	0.01	0.01	57.84	9,860,939	104.0	(5,058.0)
2049	17,850,844	12,681,455	128,816	128,318	7.25	5.72	0.59	(12.26)	58.27	0.79	1.60	0.01	0.01	59.87	10,232,525	104.3	(5,443.6)
2050	18,199,989	13,114,499	133,217	132,782	7.25	5.67	0.52	(14.59)	60.38	0.79	1.62	0.01	0.01	61.94	10,627,900	104.7	(5,859.1)
2051	18,587,545	13,549,171	137,645	137,267	7.25	5.63	0.47	(17.14)	62.59	0.79	1.64	0.01	0.01	64.17	11,047,556	105.1	(6,309.5)
2052	19,011,170	13,989,271	142,126	141,817	7.25	5.60	0.42	(19.86)	64.91	0.79	1.66	0.01	0.01	66.54	11,494,423	104.9	(6,073.8)
2053	19,466,641	14,426,616	146,594	146,335	7.25	5.57	0.39	(22.80)	67.34	0.79	1.67	0.02	0.02	69.17	12,000,586	104.7	(5,818.0)
2054	19,945,430	14,855,218	150,981	150,777	7.25	5.54	0.37	(26.34)	70.00	0.79	1.68	0.02	0.02	71.94	12,574,428	104.5	(5,585.0)
<b>Total</b>														<b>104,776,873</b>			

Note: Assumes an investment return of 20.00% for fiscal year ending 6/30/2021 and 7.25% per year thereafter.

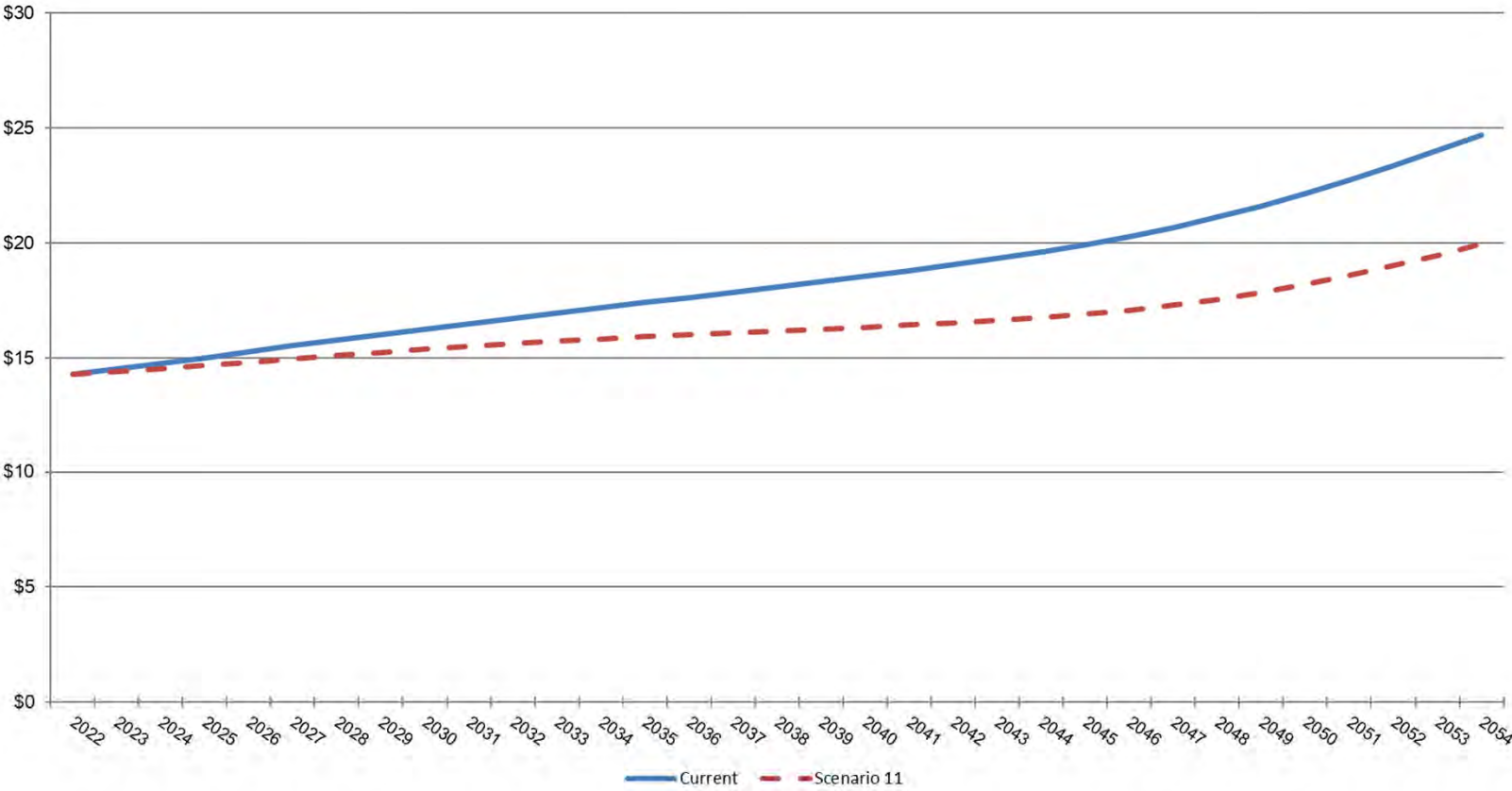
**Scenario 11 Assumptions - Comparison of Projected System Employer Contribution Amounts (Millions)**  
 Revised Demographic, 4.50% Average Salary Increase and 7.25% Interest Rate Assumption (Effective June 30, 2021 Valuation)



**Scenario 11 Assumptions - Comparison of Projected System Employer Contribution Rates**  
 Revised Demographic, 4.50% Average Salary Increase and 7.25% Interest Rate Assumption (Effective June 30, 2021 Valuation)

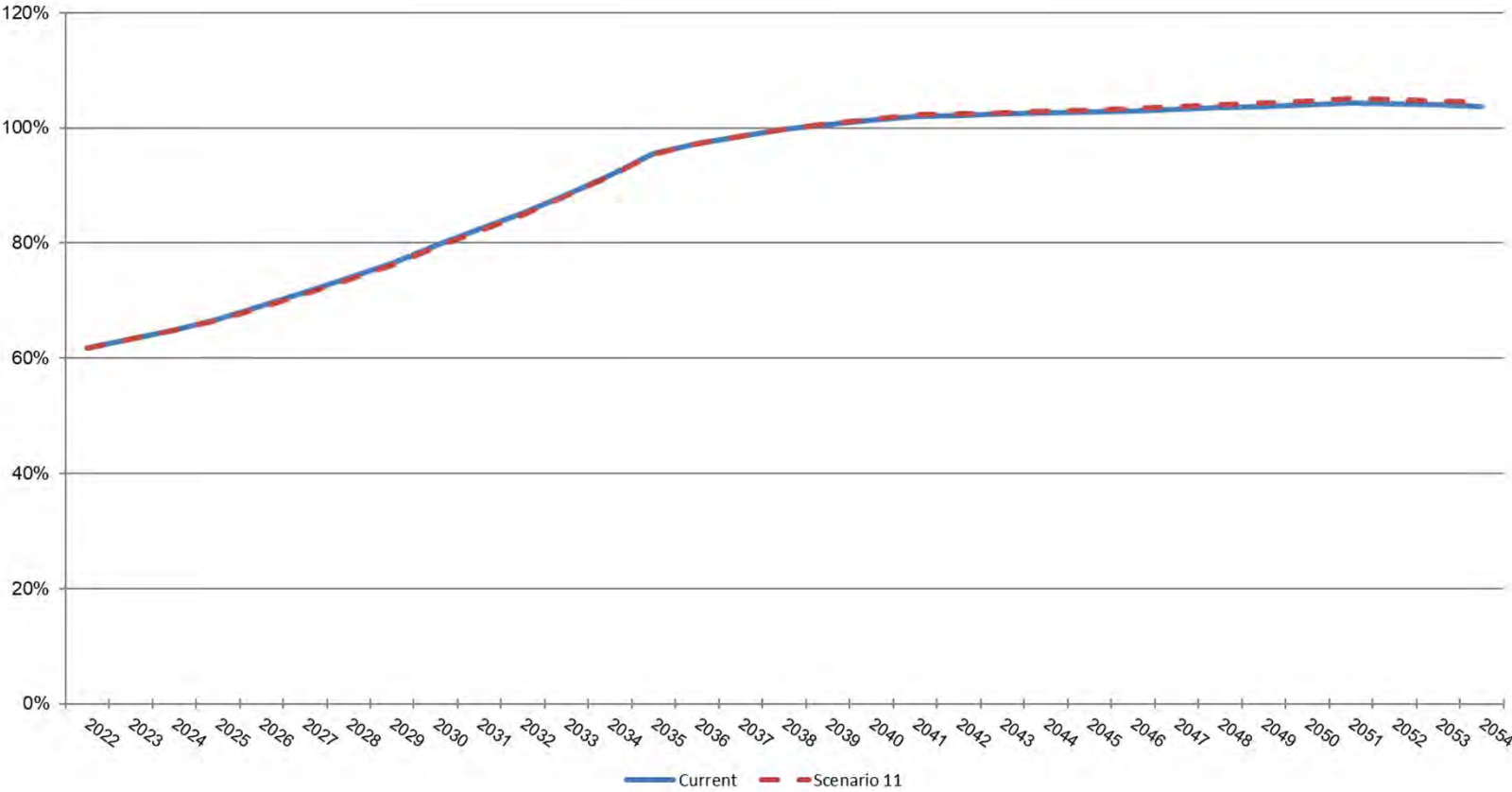


**Scenario 11 Assumptions - Comparison of Projected System Appropriation Payroll (Billions)**  
 Revised Demographic, 4.50% Average Salary Increase and 7.25% Interest Rate Assumption (Effective June 30, 2021 Valuation)

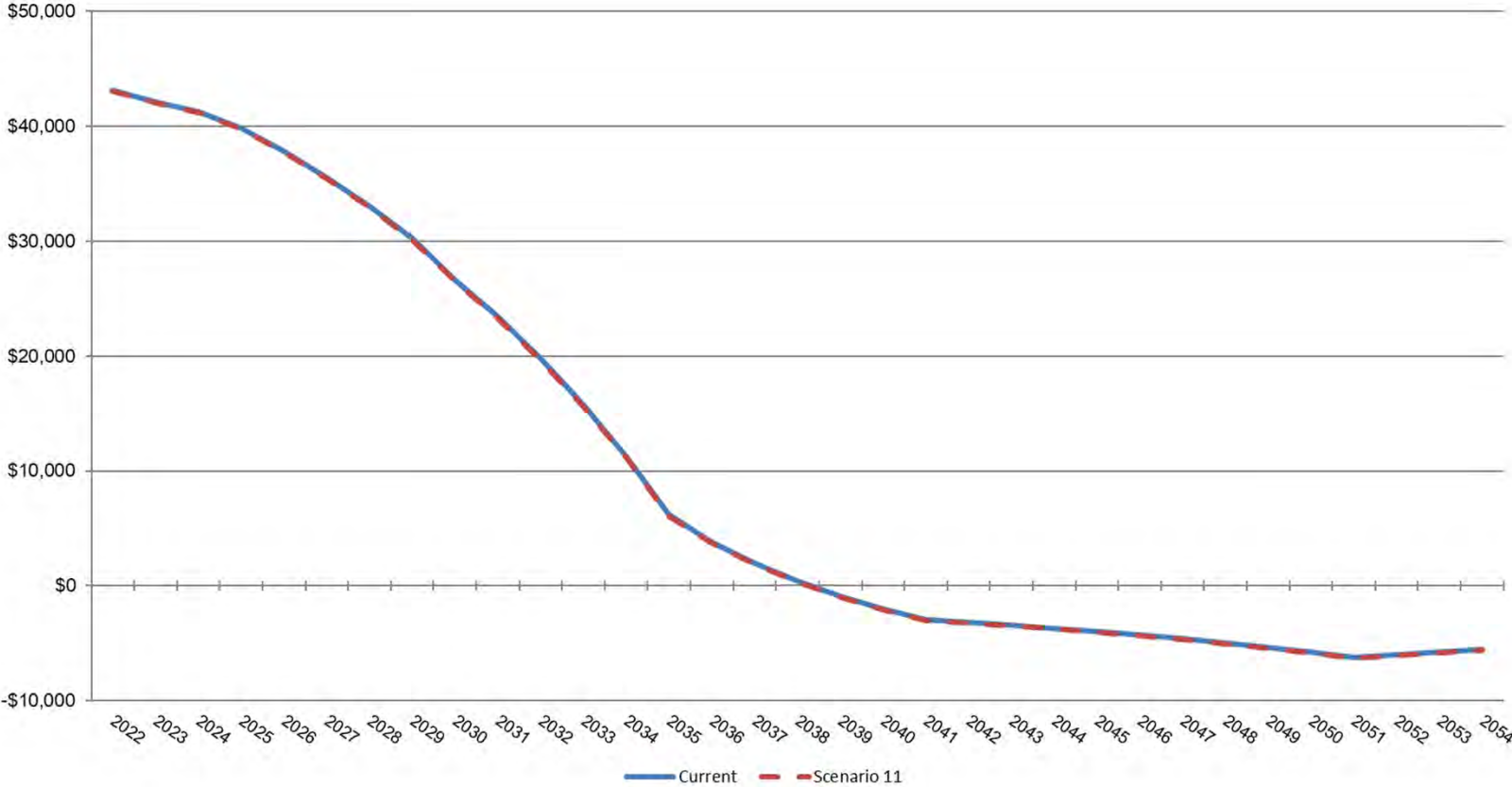


Note: Assumes a 3.50% annual payroll growth.

**Scenario 11 Assumptions - Comparison of Projected System Funded Ratio (Actuarial Value of Assets)**  
 Revised Demographic, 4.50% Average Salary Increase and 7.25% Interest Rate Assumption (Effective June 30, 2021 Valuation)



**Scenario 11 Assumptions - Comparison of Projected System Unfunded Accrued Liability  
(Actuarial Value of Assets and in Millions)**  
 Revised Demographic, 4.50% Average Salary Increase and 7.25% Interest Rate Assumption (Effective June 30, 2021 Valuation)





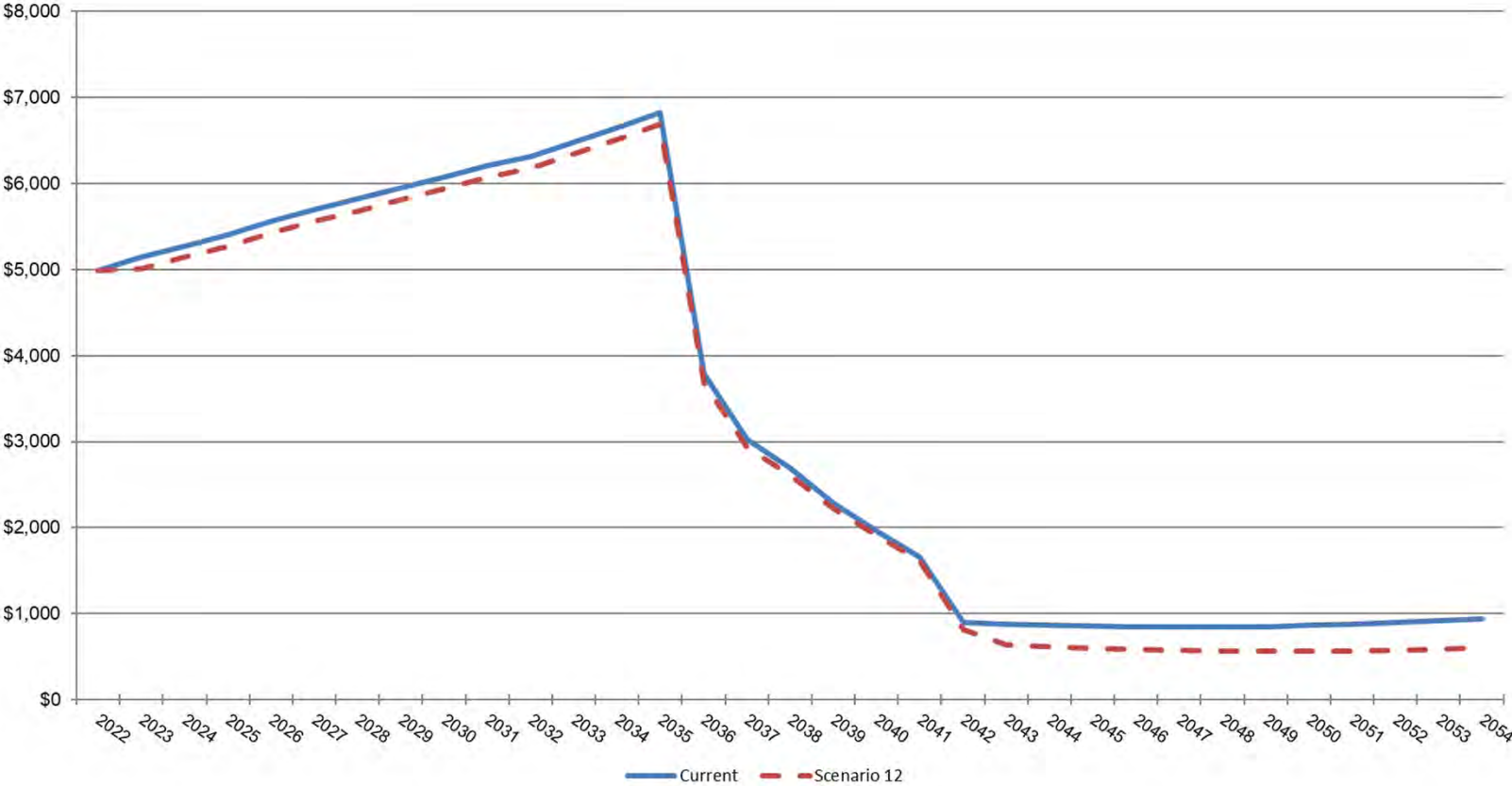
## Scenario 12 Assumptions - Projection of Contribution Rates and Funded Ratios As of June 30, 2020

Revised Demographic, 4.50% Average Salary Increase and 7.125% Interest Rate Assumption (Effective June 30, 2021 Valuation)

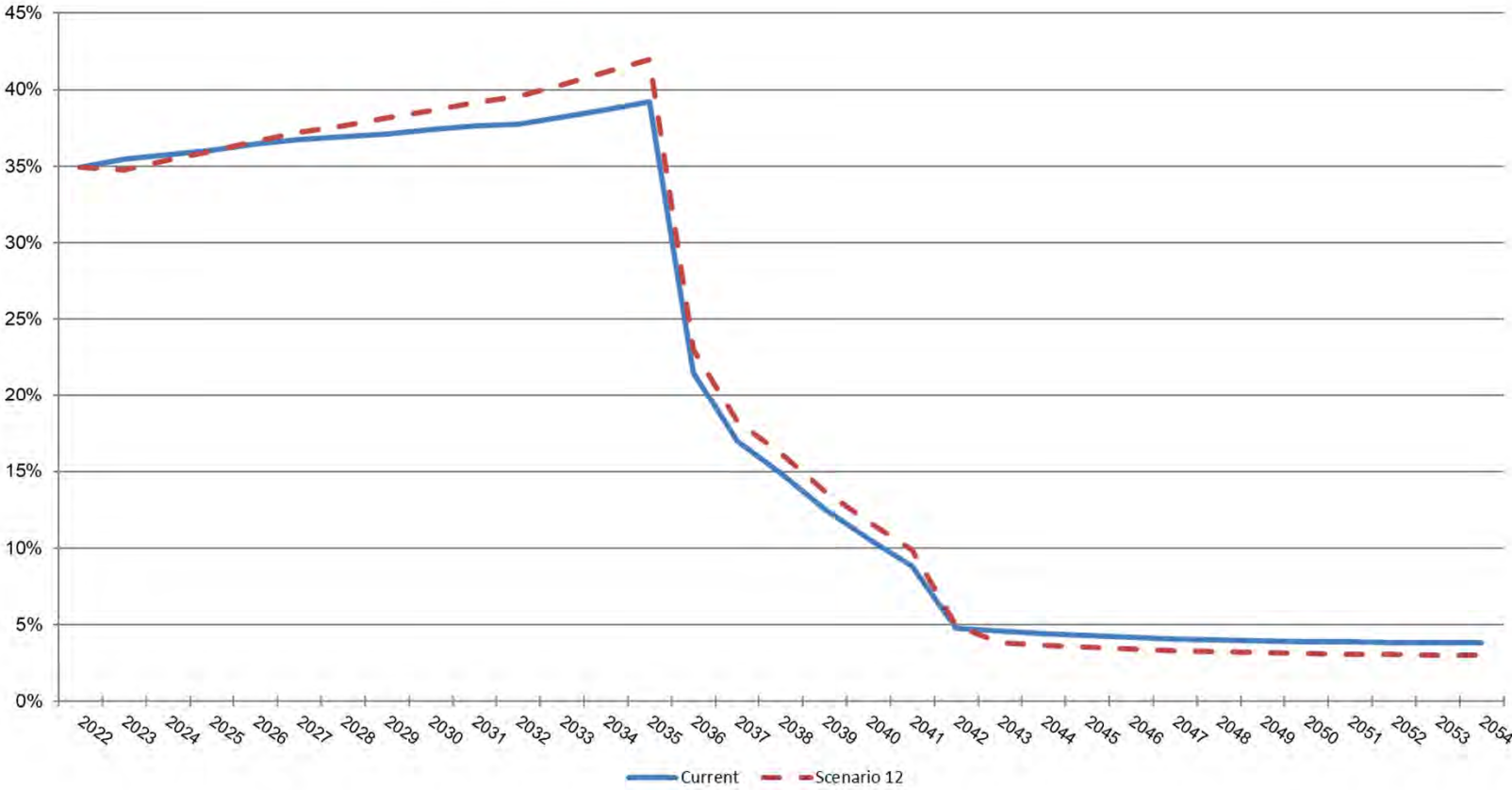
Fiscal Year Ending June 30	Appropriation Payroll (\$Thousands)	DC Payroll (\$Thousands)			Fiscal Year Market Rate of Return	Member Contribution Rate	Employer Normal Cost	Employer Unfunded Liability Rate	Preliminary Employer Pension Rate	Health Care Contribution	Employer DC Contribution Rate			Total Employer Contribution Rate	Projected Total Employer Contribution (\$Thousands)	Funded Ratio	Unfunded Accrued Liability (Based on Actuarial Value of Assets & \$Millions)
		Class TG	Class TH	Class DC Only Participants							Class T-G 2.25% DC	Class T-H 2.00% DC	DC Only Participants 2.00% DC				
2019	\$ 13,775,000					7.57 %	7.59 %	25.01 %	32.60 %	0.83 %			33.43 %		58.1 %	\$ 44,134.2	
2020	13,880,000	\$ 389,350	\$ 179,700	\$ 29,950		7.59	7.49	25.87	33.36	0.84			34.29		59.2	44,034.5	
2021	14,078,000	720,583	332,577	55,429	20.00 %	7.61	7.37	26.14	33.51	0.82	0.12	0.05	0.01	34.51	\$ 4,858,318	59.5	45,186.8
<b>2022</b>	<b>14,289,000</b>	937,344	8,423	7,440	7.125	<b>7.56</b>	<b>7.20</b>	<b>26.79</b>	<b>33.99</b>	<b>0.80</b>	0.15	0.00	0.00	<b>34.94</b>	<b>4,992,577</b>	61.0	44,582.0
2023	14,410,212	1,437,727	13,650	12,721	7.125	7.48	5.70	28.05	33.75	0.81	0.22	0.00	0.00	34.78	5,011,872	62.5	43,618.6
2024	14,535,091	1,928,352	18,754	17,889	7.125	7.39	5.52	28.75	34.27	0.82	0.30	0.00	0.00	35.39	5,144,601	64.0	42,715.8
2025	14,668,617	2,396,601	23,619	22,812	7.125	7.32	5.33	29.44	34.77	0.82	0.37	0.00	0.00	35.96	5,275,196	65.8	41,295.1
2026	14,809,835	2,847,001	28,291	27,542	7.125	7.24	5.15	30.26	35.41	0.82	0.43	0.00	0.00	36.66	5,429,259	68.0	39,236.0
2027	14,952,919	3,290,426	32,881	32,187	7.125	7.17	4.96	30.96	35.92	0.81	0.50	0.00	0.00	37.23	5,567,532	70.3	36,951.7
2028	15,095,198	3,716,920	37,290	36,653	7.125	7.10	4.77	31.51	36.28	0.81	0.55	0.00	0.00	37.64	5,681,585	72.8	34,419.0
2029	15,233,533	4,133,321	41,595	41,006	7.125	7.04	4.58	32.11	36.69	0.81	0.61	0.01	0.01	38.13	5,808,712	75.4	31,536.6
2030	15,370,158	4,538,264	45,777	45,236	7.125	6.98	4.39	32.77	37.16	0.79	0.66	0.01	0.01	38.63	5,937,959	78.4	27,956.0
2031	15,501,669	4,947,037	49,955	49,398	7.125	6.92	4.19	33.44	37.63	0.80	0.72	0.01	0.01	39.17	6,071,496	81.2	24,673.8
2032	15,625,531	5,355,872	54,135	53,546	7.125	6.86	4.00	33.98	37.98	0.79	0.77	0.01	0.01	39.56	6,182,088	84.1	21,046.1
2033	15,735,830	5,762,264	58,291	57,667	7.125	6.80	3.80	34.89	38.69	0.79	0.82	0.01	0.01	40.32	6,344,319	87.3	16,996.9
2034	15,832,430	6,169,350	62,453	61,799	7.125	6.74	3.60	35.86	39.46	0.79	0.88	0.01	0.01	41.15	6,514,401	90.7	12,490.1
2035	15,921,212	6,580,460	66,654	65,974	7.125	6.68	3.38	36.88	40.26	0.79	0.93	0.01	0.01	42.00	6,686,712	94.5	7,488.7
2036	16,006,925	6,996,948	70,909	70,208	7.125	6.61	3.18	38.02	41.20	0.79	0.98	0.01	0.01	42.99	6,880,586	96.2	5,139.6
2037	16,089,022	7,417,873	75,206	74,484	7.125	6.55	2.95	39.43	42.38	0.79	1.04	0.01	0.01	44.23	7,133,594	97.5	3,367.3
2038	16,170,826	7,843,478	79,552	78,813	7.125	6.48	2.74	41.50	43.74	0.79	1.09	0.01	0.01	45.14	7,409,186	98.7	1,790.2
2039	16,251,211	8,274,423	83,949	83,200	7.125	6.41	2.51	43.20	45.21	0.79	1.15	0.01	0.01	46.67	7,708,814	99.6	482.5
2040	16,333,934	8,710,019	88,390	87,630	7.125	6.33	2.30	44.77	46.77	0.79	1.20	0.01	0.01	48.23	8,039,394	100.5	(613.2)
2041	16,420,521	9,150,042	92,874	92,111	7.125	6.26	2.08	46.27	48.22	0.79	1.25	0.01	0.01	49.88	8,422,094	101.1	(1,514.7)
2042	16,514,642	9,593,267	97,392	96,628	7.125	6.18	1.86	47.73	49.63	0.79	1.31	0.01	0.01	51.49	8,877,770	101.3	(1,687.8)
2043	16,621,186	10,039,744	101,944	101,188	7.125	6.11	1.65	(0.33)	51.02	0.79	1.36	0.01	0.01	53.22	9,409,929	101.3	(1,706.4)
2044	16,746,406	10,487,321	106,508	105,760	7.125	6.04	1.44	(0.63)	54.37	0.79	1.41	0.01	0.01	55.06	10,029,918	101.3	(1,719.2)
2045	16,896,266	10,934,195	111,068	110,330	7.125	5.96	1.26	(0.94)	57.62	0.79	1.46	0.01	0.01	56.93	10,749,438	101.3	(1,721.5)
2046	17,075,415	11,376,095	115,559	114,879	7.125	5.89	1.10	(1.24)	60.77	0.79	1.50	0.01	0.01	58.87	11,582,272	101.3	(1,717.6)
2047	17,291,388	11,815,210	120,027	119,398	7.125	5.83	0.95	(1.53)	63.82	0.79	1.54	0.01	0.01	60.81	12,537,616	101.3	(1,714.8)
2048	17,547,040	12,248,800	124,420	123,861	7.125	5.77	0.84	(1.83)	66.77	0.79	1.57	0.01	0.01	62.72	13,625,015	101.3	(1,701.8)
2049	17,850,844	12,681,455	128,816	128,318	7.125	5.72	0.74	(2.13)	69.62	0.79	1.60	0.01	0.01	64.66	14,852,302	101.3	(1,680.4)
2050	18,199,989	13,114,499	133,217	132,782	7.125	5.67	0.67	(2.43)	72.37	0.79	1.62	0.01	0.01	66.61	16,249,200	101.3	(1,651.6)
2051	18,587,545	13,549,171	137,645	137,267	7.125	5.63	0.61	(2.73)	75.02	0.79	1.64	0.01	0.01	68.56	17,817,779	101.3	(1,617.9)
2052	19,011,170	13,989,271	142,126	141,817	7.125	5.60	0.57	(3.03)	77.57	0.79	1.66	0.01	0.01	70.51	19,594,940	101.0	(1,220.0)
2053	19,466,641	14,426,616	146,594	146,335	7.125	5.57	0.53	(3.33)	80.02	0.79	1.67	0.02	0.02	72.46	21,589,839	100.7	(829.1)
2054	19,945,430	14,855,218	150,981	150,777	7.125	5.54	0.51	(3.63)	82.47	0.79	1.68	0.02	0.02	74.41	23,832,352	100.4	(468.9)
<b>Total</b>														<b>108,325,665</b>			

Note: Assumes an investment return of 20.00% for fiscal year ending 6/30/2021 and 7.125% per year thereafter.

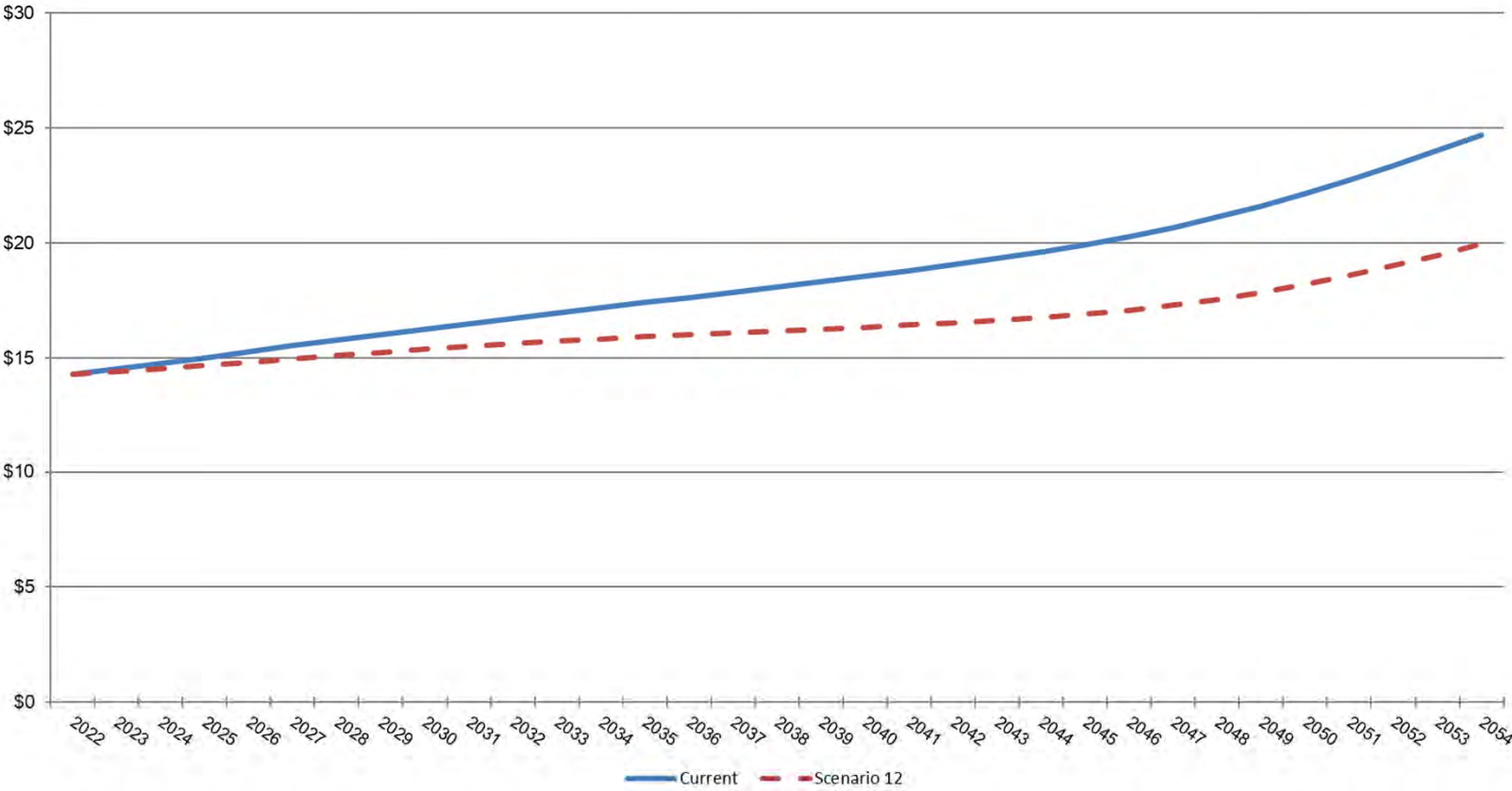
**Scenario 12 Assumptions - Comparison of Projected System Employer Contribution Amounts (Millions)**  
 Revised Demographic, 4.50% Average Salary Increase and 7.125% Interest Rate Assumption (Effective June 30, 2021 Valuation)



**Scenario 12 Assumptions - Comparison of Projected System Employer Contribution Rates**  
 Revised Demographic, 4.50% Average Salary Increase and 7.125% Interest Rate Assumption (Effective June 30, 2021 Valuation)

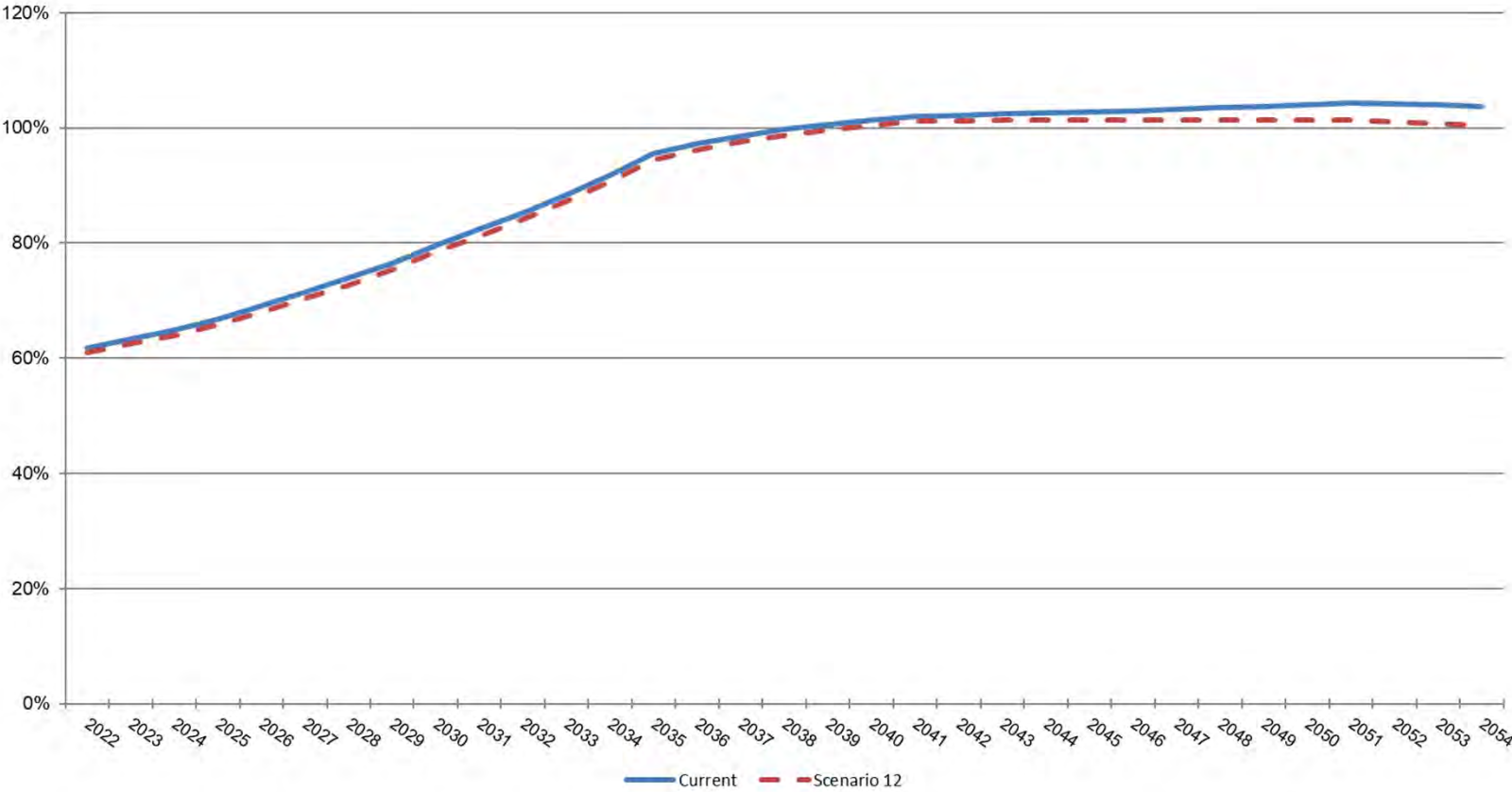


**Scenario 12 Assumptions - Comparison of Projected System Appropriation Payroll (Billions)**  
 Revised Demographic, 4.50% Average Salary Increase and 7.125% Interest Rate Assumption (Effective June 30, 2021 Valuation)

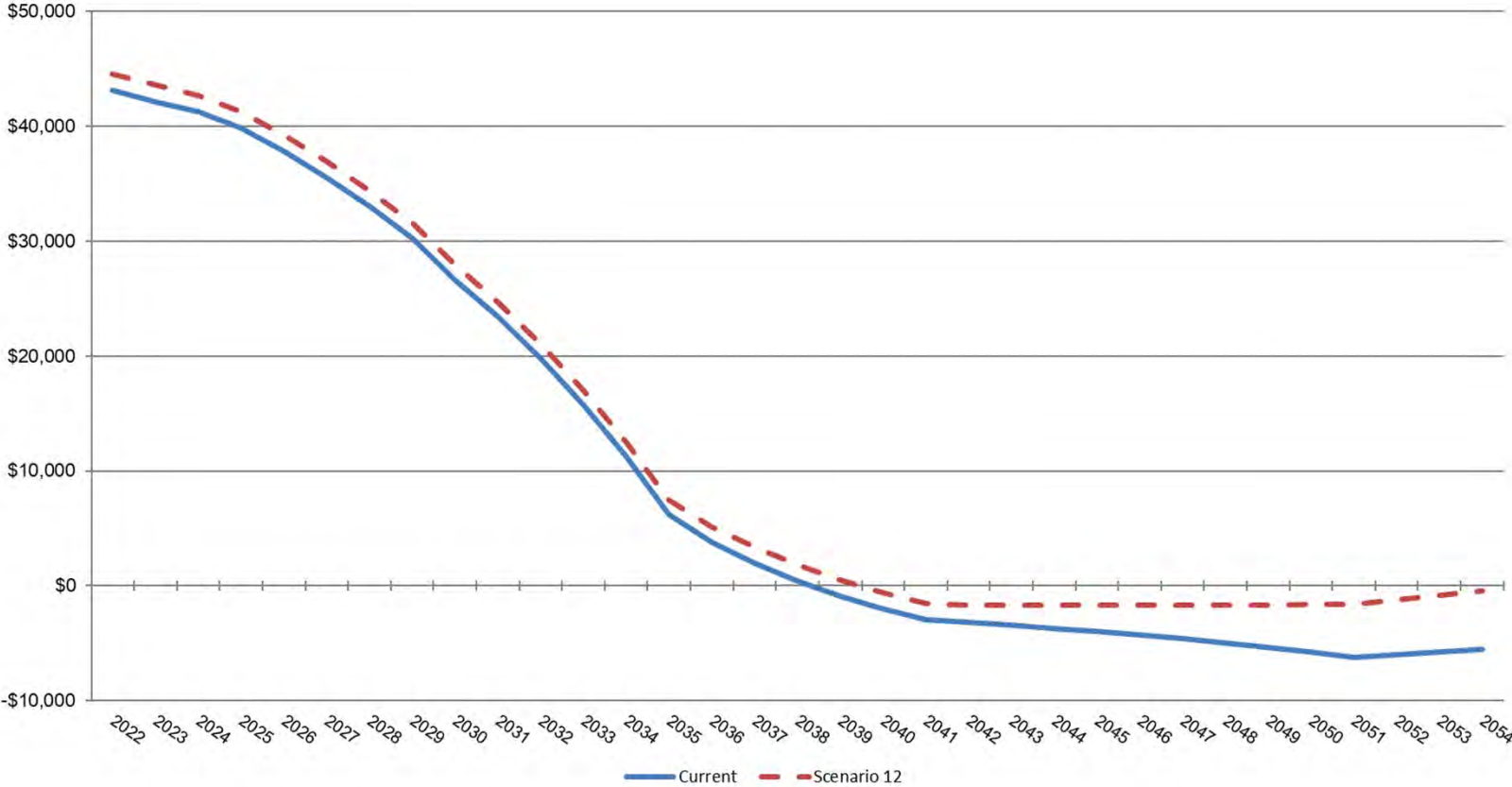


Note: Assumes a 3.50% annual payroll growth.

**Scenario 12 Assumptions - Comparison of Projected System Funded Ratio (Actuarial Value of Assets)**  
Revised Demographic, 4.50% Average Salary Increase and 7.125% Interest Rate Assumption (Effective June 30, 2021 Valuation)



**Scenario 12 Assumptions - Comparison of Projected System Unfunded Accrued Liability  
(Actuarial Value of Assets and in Millions)**  
 Revised Demographic, 4.50% Average Salary Increase and 7.125% Interest Rate Assumption (Effective June 30, 2021 Valuation)



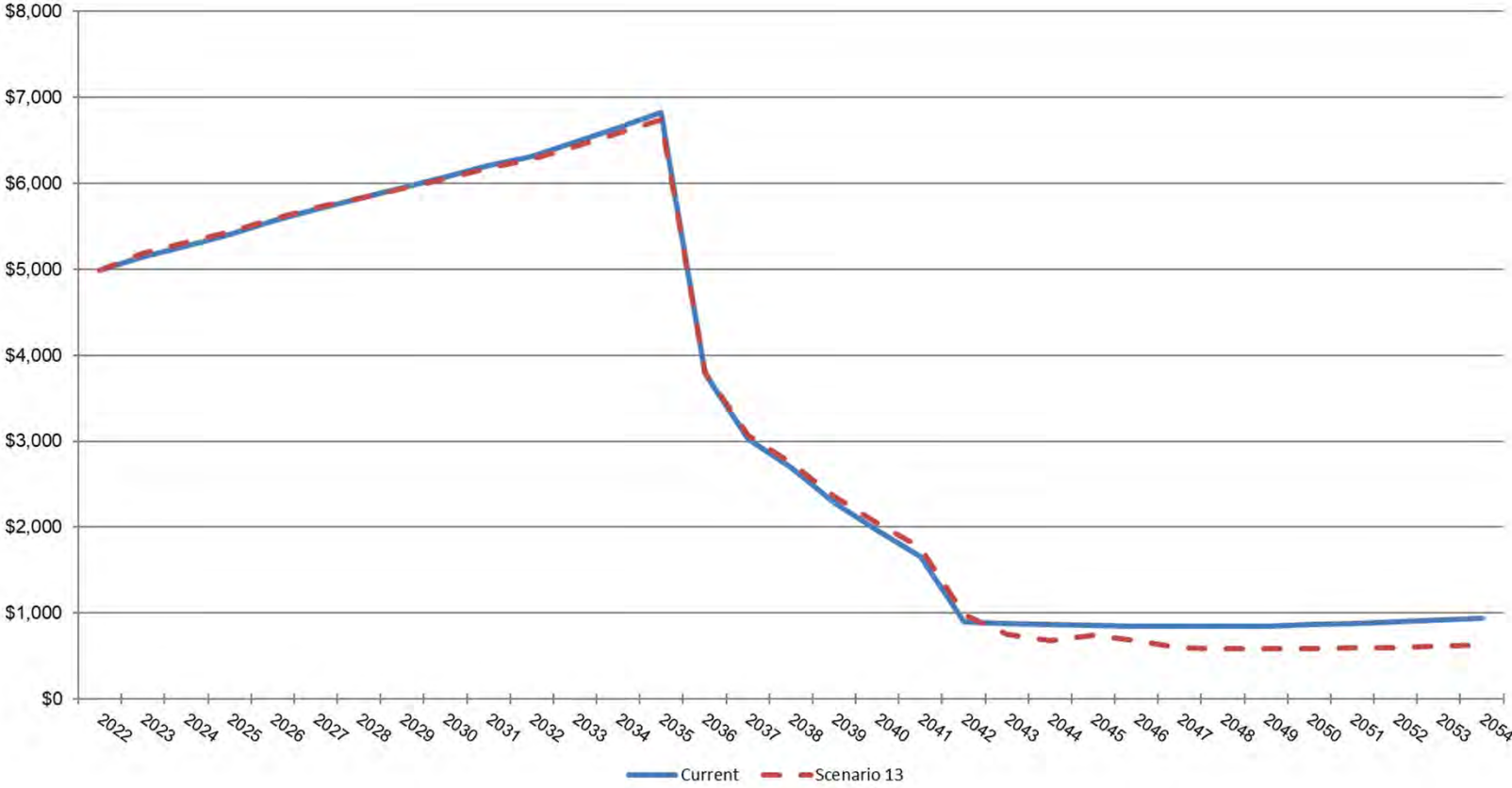
## Scenario 13 Assumptions - Projection of Contribution Rates and Funded Ratios As of June 30, 2020

Revised Demographic, 4.50% Average Salary Increase and 7.00% Interest Rate Assumption (Effective June 30, 2021 Valuation)

Fiscal Year Ending June 30	Appropriation Payroll (\$Thousands)	DC Payroll (\$Thousands)			Fiscal Year Market Rate of Return	Member Contribution Rate	Employer Normal Cost	Employer Unfunded Liability Rate	Preliminary Employer Pension Rate	Health Care Contribution	Employer DC Contribution Rate			Total Employer Contribution Rate	Projected Total Employer Contribution (\$Thousands)	Funded Ratio	Unfunded Accrued Liability (Based on Actuarial Value of Assets & \$Millions)
		Class TG	Class TH	Class DC Only Participants							Class T-G 2.25% DC	Class T-H 2.00% DC	DC Only Participants 2.00% DC				
2019	\$ 13,775,000					7.57 %	7.59 %	25.01 %	32.60 %	0.83 %			33.43 %		58.1 %	\$ 44,134.2	
2020	13,880,000	\$ 389,350	\$ 179,700	\$ 29,950		7.59	7.49	25.87	33.36	0.84			34.29		59.2	44,034.5	
2021	14,078,000	720,583	332,577	55,429	20.00 %	7.61	7.37	26.14	33.51	0.82	0.12	0.05	0.01	34.51	\$ 4,858,318	58.8	46,642.1
<b>2022</b>	<b>14,289,000</b>	937,344	8,423	7,440	7.00	<b>7.56</b>	<b>7.20</b>	<b>26.79</b>	<b>33.99</b>	<b>0.80</b>	0.15	0.00	0.00	<b>34.94</b>	<b>4,992,577</b>	60.1	46,137.5
2023	14,358,032	1,432,521	13,600	12,675	7.00	7.48	6.05	29.05	35.10	0.82	0.22	0.00	0.00	36.14	5,188,993	61.7	45,099.1
2024	14,482,459	1,921,370	18,686	17,824	7.00	7.40	5.86	29.71	35.57	0.82	0.30	0.00	0.00	36.69	5,313,095	63.3	44,123.4
2025	14,615,502	2,387,923	23,534	22,730	7.00	7.32	5.67	30.34	36.01	0.82	0.37	0.00	0.00	37.20	5,437,683	65.1	42,632.8
2026	14,756,209	2,836,692	28,188	27,442	7.00	7.24	5.48	31.11	36.59	0.83	0.43	0.00	0.00	37.85	5,585,411	67.4	40,508.0
2027	14,898,775	3,278,512	32,762	32,071	7.00	7.17	5.29	31.76	37.05	0.81	0.50	0.00	0.00	38.36	5,715,070	69.7	38,163.8
2028	15,040,538	3,703,461	37,155	36,520	7.00	7.10	5.09	32.24	37.33	0.82	0.55	0.00	0.00	38.70	5,821,121	72.2	35,578.9
2029	15,178,372	4,118,354	41,444	40,858	7.00	7.04	4.89	32.78	37.67	0.81	0.61	0.01	0.01	39.11	5,936,664	74.8	32,653.1
2030	15,314,503	4,521,831	45,612	45,072	7.00	6.98	4.69	33.38	38.07	0.80	0.66	0.01	0.01	39.55	6,056,806	77.9	29,039.5
2031	15,445,537	4,929,124	49,774	49,219	7.00	6.92	4.49	33.97	38.46	0.80	0.72	0.01	0.01	40.00	6,178,962	80.6	25,737.1
2032	15,568,951	5,336,478	53,939	53,353	7.00	6.86	4.29	34.45	38.74	0.80	0.77	0.01	0.01	40.33	6,278,774	83.5	22,102.8
2033	15,678,850	5,741,399	58,080	57,458	7.00	6.80	4.08	35.28	39.36	0.80	0.82	0.01	0.01	41.00	6,428,436	86.6	18,062.4
2034	15,775,101	6,147,011	62,227	61,575	7.00	6.74	3.86	36.17	40.03	0.80	0.88	0.01	0.01	41.73	6,583,494	90.0	13,582.2
2035	15,863,561	6,556,632	66,413	65,735	7.00	6.68	3.65	37.12	40.77	0.80	0.93	0.01	0.01	42.52	6,744,638	93.7	8,563.7
2036	15,948,964	6,971,613	70,653	69,954	7.00	6.61	3.43	38.58	42.01	0.80	0.98	0.01	0.01	43.41	6,911,155	97.5	6,130.7
2037	16,030,763	7,391,013	74,934	74,215	7.00	6.55	3.20	40.06	43.36	0.80	1.04	0.01	0.01	44.36	7,082,605	101.0	4,252.7
2038	16,112,271	7,815,077	79,264	78,528	7.00	6.48	2.97	42.13	44.81	0.80	1.09	0.01	0.01	45.36	7,260,882	104.1	2,555.2
2039	16,192,365	8,244,461	83,645	82,898	7.00	6.41	2.73	44.86	46.36	0.80	1.15	0.01	0.01	46.41	7,446,632	107.2	1,108.3
2040	16,274,789	8,678,480	88,070	87,313	7.00	6.33	2.51	48.06	48.01	0.80	1.20	0.01	0.01	47.59	7,639,054	110.3	(146.0)
2041	16,361,062	9,116,910	92,538	91,778	7.00	6.26	2.27	51.45	50.01	0.80	1.25	0.01	0.01	48.74	7,837,838	113.4	(1,227.1)
2042	16,454,842	9,558,530	97,039	96,278	7.00	6.18	2.05	55.80	52.06	0.80	1.31	0.01	0.01	49.99	8,042,569	116.5	(1,622.4)
2043	16,561,001	10,003,390	101,575	100,821	7.00	6.11	1.82	61.13	54.31	0.80	1.36	0.01	0.01	51.34	8,253,641	119.6	(1,833.8)
2044	16,685,768	10,449,347	106,122	105,377	7.00	6.04	1.61	67.66	56.76	0.80	1.41	0.01	0.01	52.79	8,470,943	122.7	(2,006.7)
2045	16,835,085	10,894,603	110,665	109,930	7.00	5.96	1.42	75.21	59.31	0.80	1.46	0.01	0.01	54.34	8,693,443	125.8	(2,270.1)
2046	17,013,585	11,334,902	115,140	114,463	7.00	5.89	1.25	84.86	62.01	0.80	1.50	0.01	0.01	55.99	8,921,219	128.9	(2,509.8)
2047	17,228,775	11,772,427	119,592	118,966	7.00	5.83	1.10	96.51	65.06	0.80	1.54	0.01	0.01	57.74	9,154,116	132.0	(2,701.8)
2048	17,483,502	12,204,447	123,969	123,413	7.00	5.77	0.97	110.06	68.36	0.80	1.57	0.01	0.01	59.59	9,392,446	135.1	(2,903.9)
2049	17,786,206	12,635,535	128,350	127,854	7.00	5.72	0.87	125.81	72.01	0.80	1.60	0.01	0.01	61.54	9,636,166	138.2	(3,119.9)
2050	18,134,087	13,067,011	132,734	132,301	7.00	5.67	0.80	143.96	76.01	0.80	1.62	0.01	0.01	63.59	9,885,544	141.3	(3,352.2)
2051	18,520,239	13,500,110	137,146	136,770	7.00	5.63	0.74	164.51	80.36	0.80	1.64	0.01	0.01	65.74	10,140,648	144.4	(3,604.8)
2052	18,942,331	13,938,616	141,612	141,303	7.00	5.60	0.69	188.06	85.21	0.80	1.66	0.01	0.01	67.99	10,402,472	147.5	(3,372.6)
2053	19,396,152	14,374,377	146,064	145,805	7.00	5.57	0.65	213.81	90.76	0.80	1.67	0.02	0.02	70.34	10,670,918	150.6	(3,138.9)
2054	19,873,207	14,801,427	150,434	150,231	7.00	5.54	0.62	242.06	97.01	0.80	1.68	0.02	0.02	72.79	10,945,019	153.7	(2,934.6)
<b>Total</b>														111,519,348			

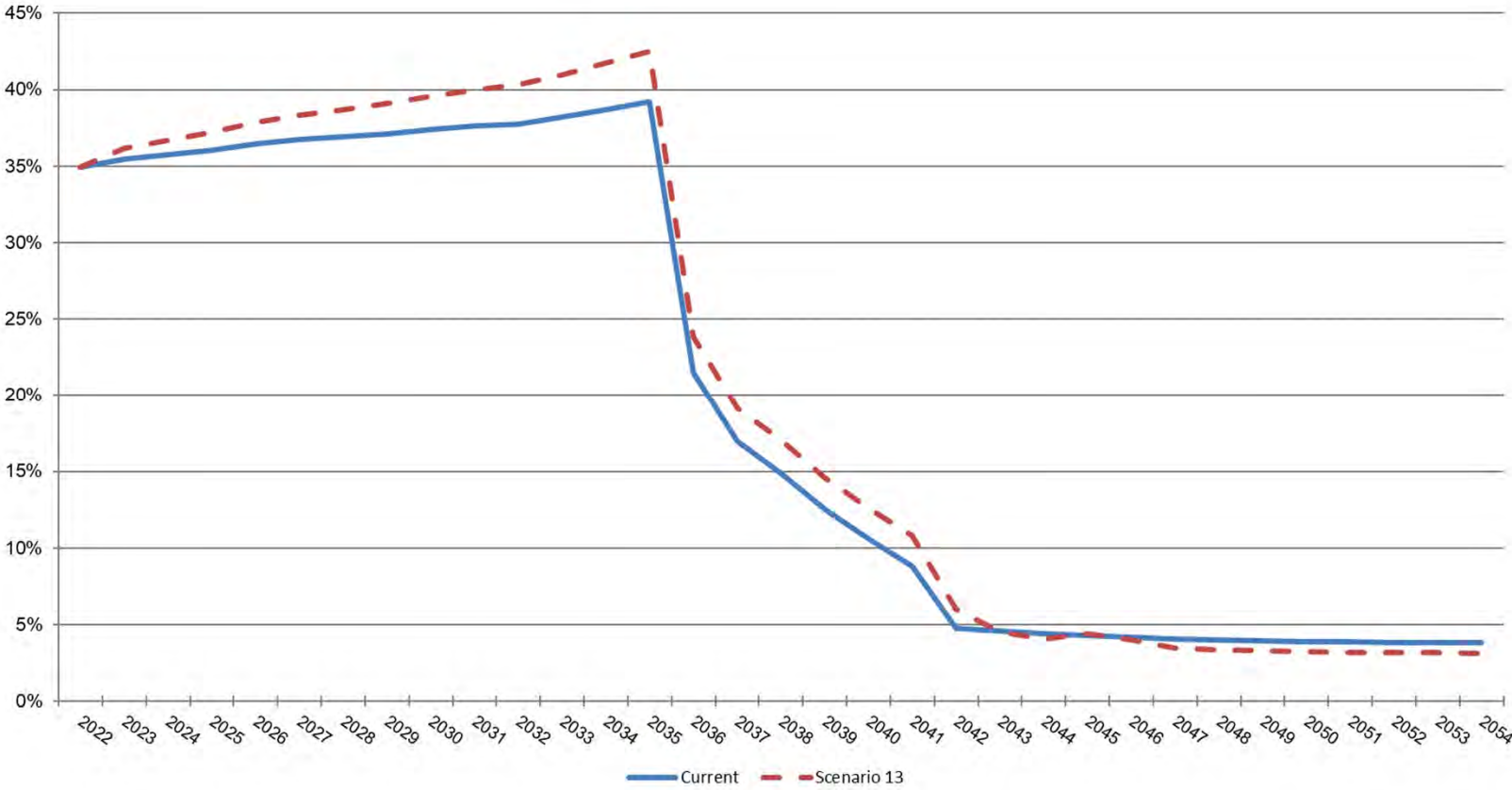
Note: Assumes an investment return of 20.00% for fiscal year ending 6/30/2021 and 7.00% per year thereafter.

**Scenario 13 Assumptions - Comparison of Projected System Employer Contribution Amounts (Millions)**  
 Revised Demographic, 4.50% Average Salary Increase and 7.00% Interest Rate Assumption (Effective June 30, 2021 Valuation)

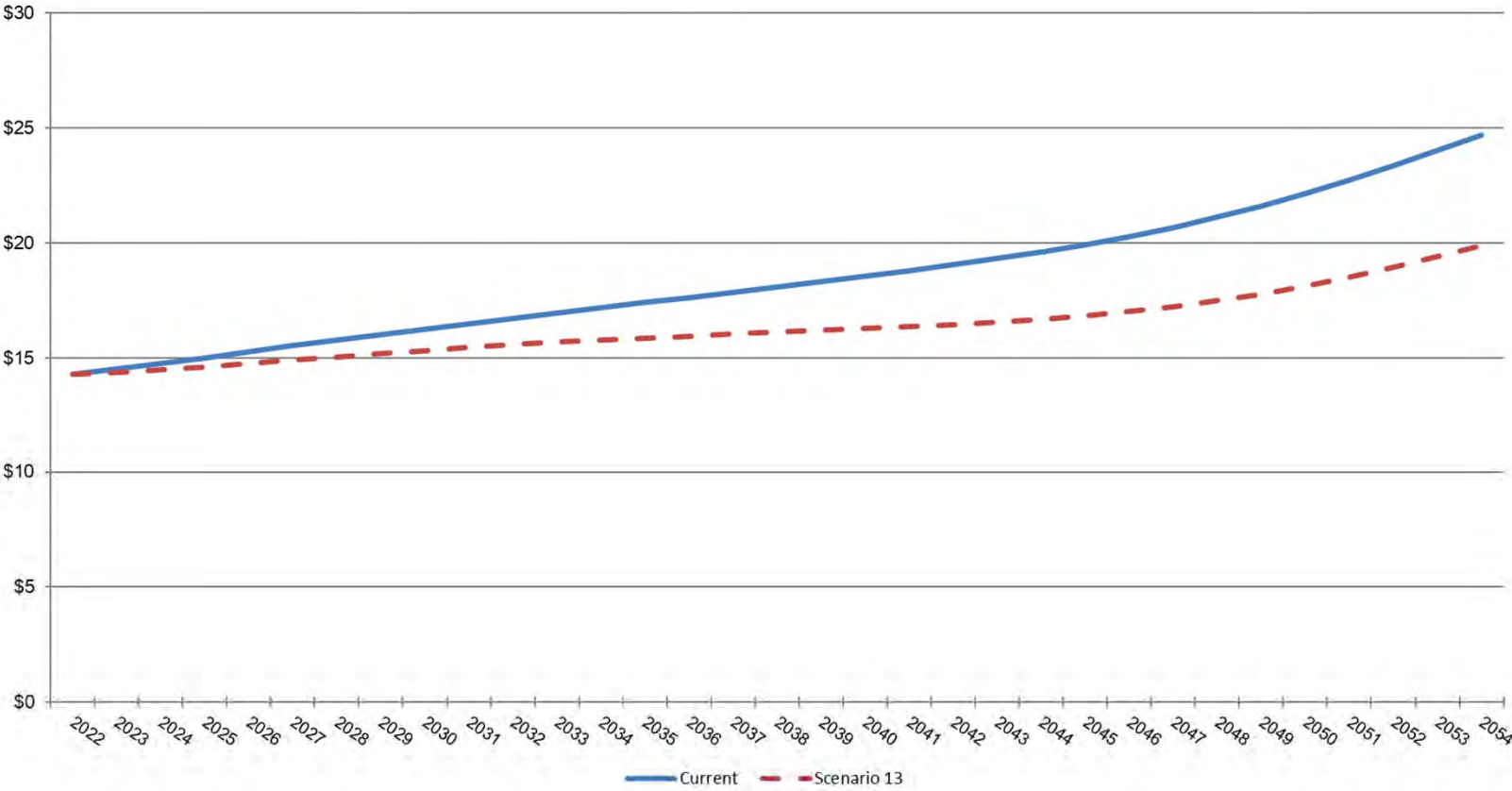




**Scenario 13 Assumptions - Comparison of Projected System Employer Contribution Rates**  
 Revised Demographic, 4.50% Average Salary Increase and 7.00% Interest Rate Assumption (Effective June 30, 2021 Valuation)

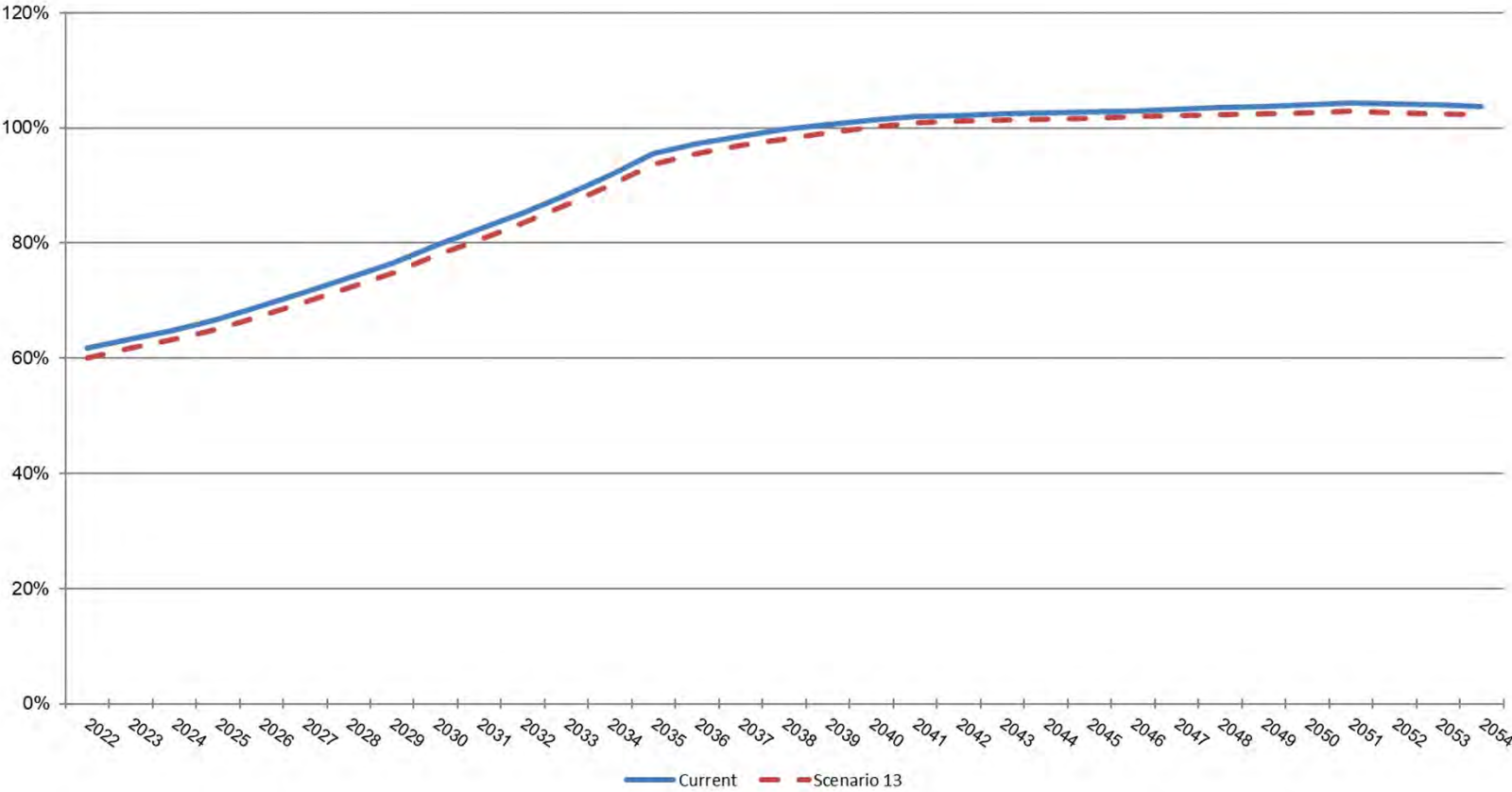


**Scenario 13 Assumptions - Comparison of Projected System Appropriation Payroll (Billions)**  
 Revised Demographic, 4.50% Average Salary Increase and 7.00% Interest Rate Assumption (Effective June 30, 2021 Valuation)

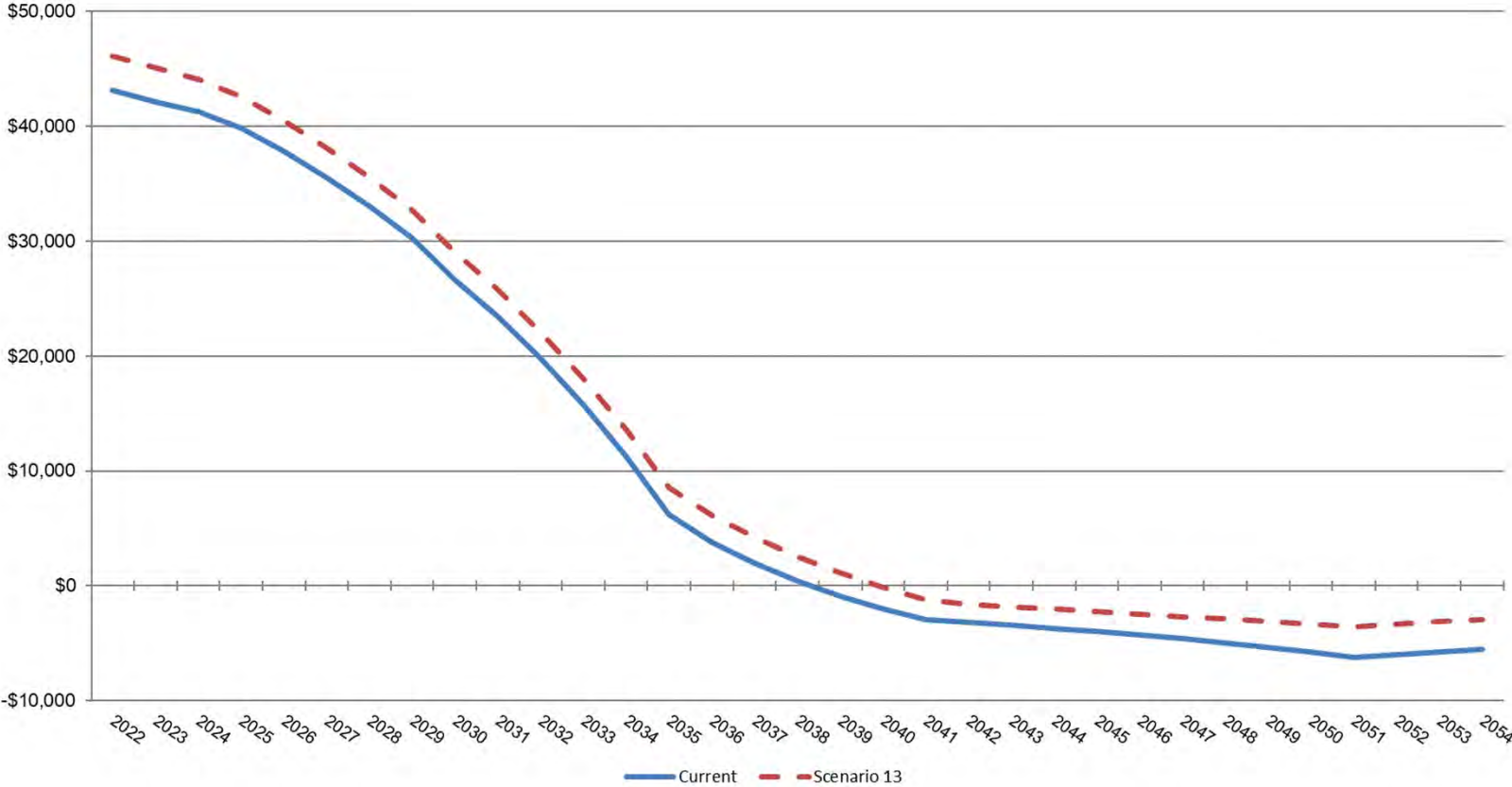


Note: Current assumes a 3.50% annual payroll growth while Scenario 13 assumes a 3.25% annual payroll growth.

**Scenario 13 Assumptions - Comparison of Projected System Funded Ratio (Actuarial Value of Assets)**  
Revised Demographic, 4.50% Average Salary Increase and 7.00% Interest Rate Assumption (Effective June 30, 2021 Valuation)



**Scenario 13 Assumptions - Comparison of Projected System Unfunded Accrued Liability  
(Actuarial Value of Assets and in Millions)**  
 Revised Demographic, 4.50% Average Salary Increase and 7.00% Interest Rate Assumption (Effective June 30, 2021 Valuation)



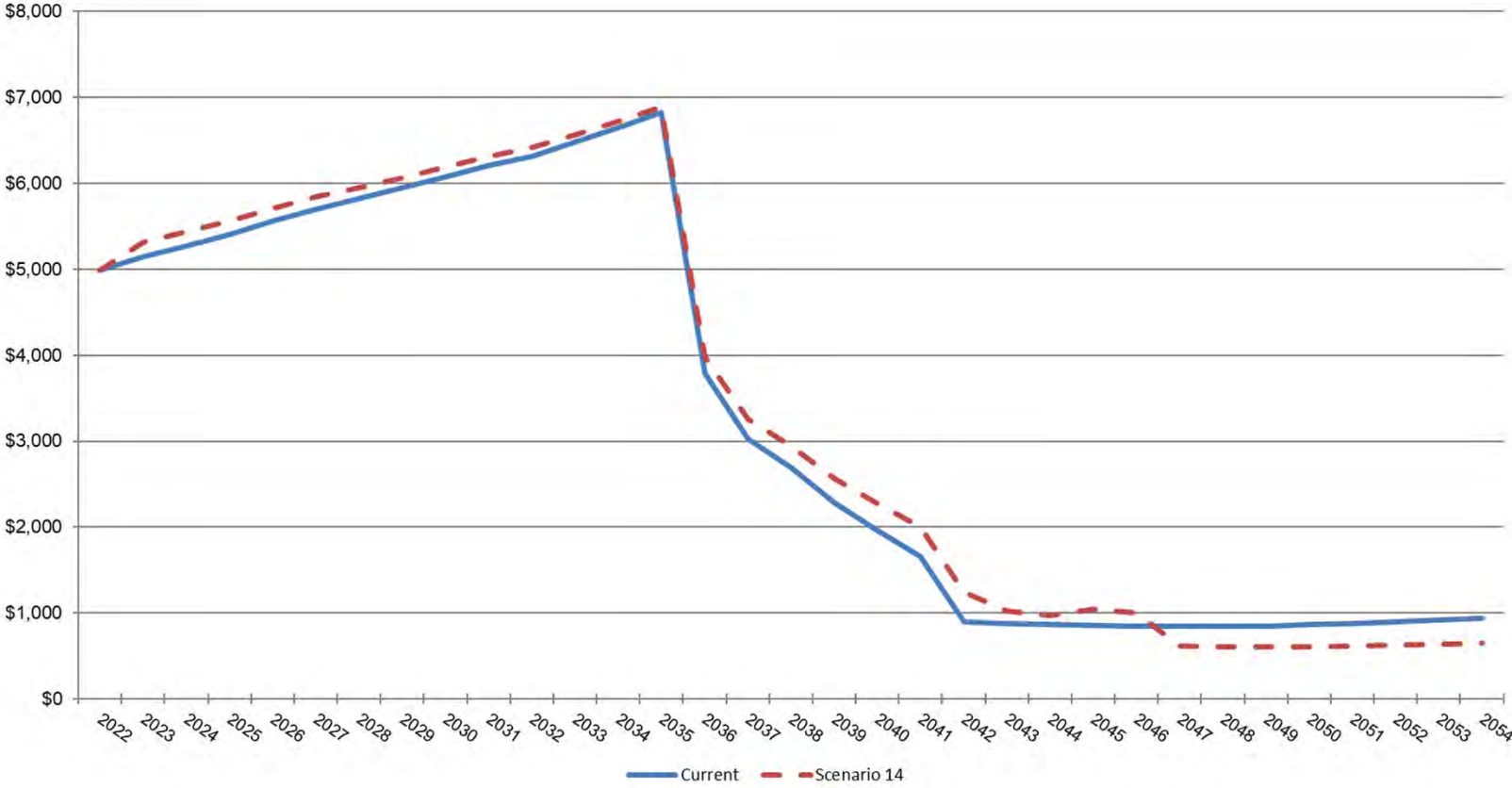
## Scenario 14 Assumptions - Projection of Contribution Rates and Funded Ratios As of June 30, 2020

### Revised Demographic, 4.50% Average Salary Increase and 6.875% Interest Rate Assumption (Effective June 30, 2021 Valuation)

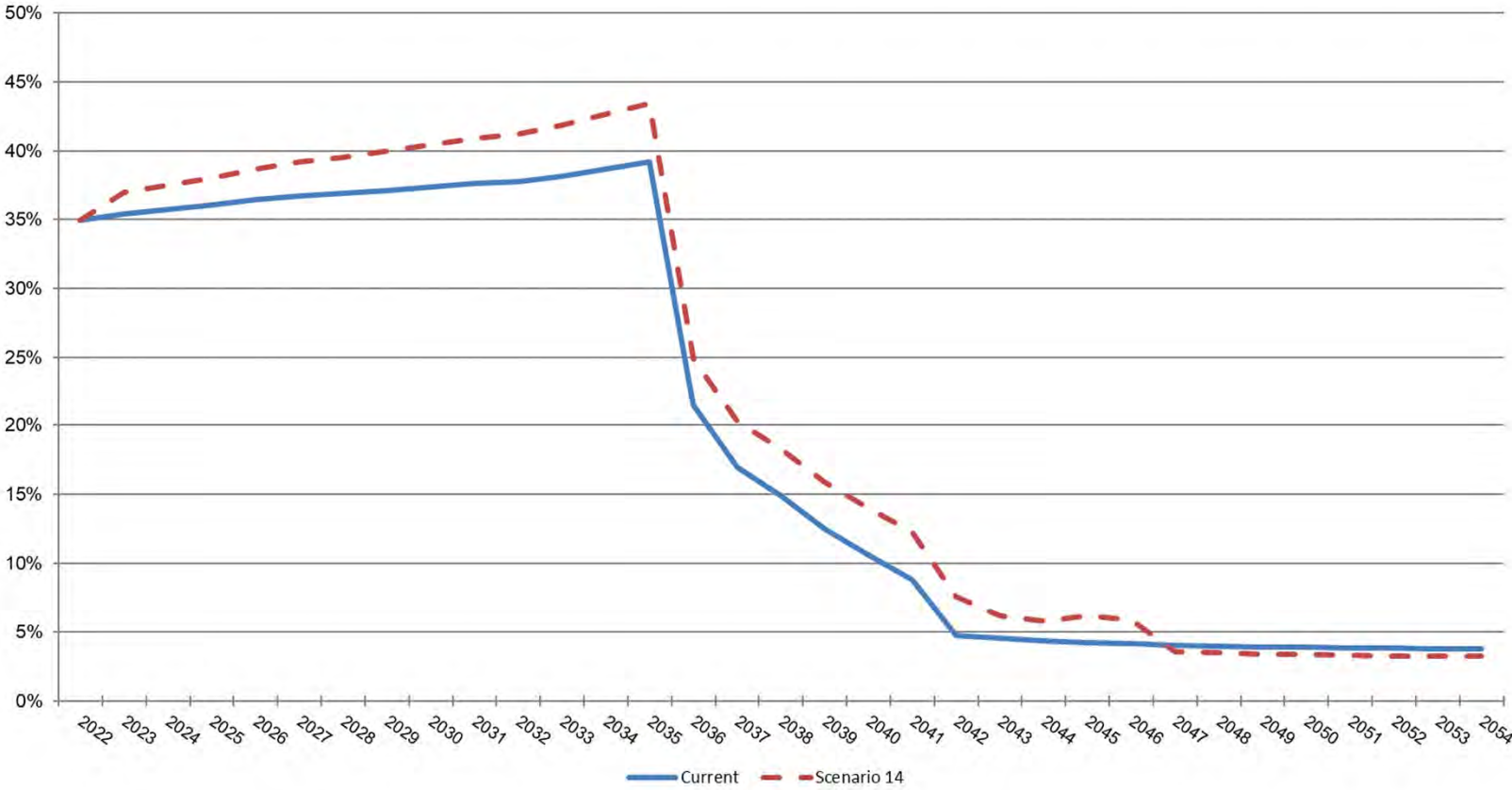
Fiscal Year Ending June 30	Appropriation Payroll (\$Thousands)	DC Payroll (\$Thousands)			Fiscal Year Market Rate of Return	Member Contribution Rate	Employer Normal Cost	Employer Unfunded Liability Rate	Preliminary Employer Pension Rate	Health Care Contribution	Employer DC Contribution Rate			Total Employer Contribution Rate	Projected Total Employer Contribution (\$Thousands)	Funded Ratio	Unfunded Accrued Liability (Based on Actuarial Value of Assets & \$Millions)
		Class TG	Class TH	Class DC Only Participants							Class T-G 2.25% DC	Class T-H 2.00% DC	DC Only Participants 2.00% DC				
2019	\$ 13,775,000					7.57 %	7.59 %	25.01 %	32.60 %	0.83 %			33.43 %		58.1 %	\$ 44,134.2	
2020	13,880,000	\$ 389,350	\$ 179,700	\$ 29,950		7.59	7.49	25.87	33.36	0.84			34.29		<b>59.2</b>	<b>44,034.5</b>	
2021	14,078,000	720,583	332,577	55,429	20.00 %	7.61	7.37	26.14	33.51	0.82	0.12	0.05	0.01	34.51	\$ 4,858,318	58.0	48,128.2
<b>2022</b>	<b>14,289,000</b>	937,344	8,423	7,440	6.875	<b>7.56</b>	<b>7.20</b>	<b>26.79</b>	<b>33.99</b>	<b>0.80</b>	0.15	0.00	0.00	<b>34.94</b>	<b>4,992,577</b>	59.3	47,722.1
2023	14,358,032	1,432,521	13,600	12,675	6.875	7.48	6.42	29.51	35.93	0.82	0.22	0.00	0.00	36.97	5,308,164	60.9	46,669.5
2024	14,482,459	1,921,370	18,686	17,824	6.875	7.39	6.23	30.18	36.41	0.82	0.30	0.00	0.00	37.53	5,434,961	62.4	45,678.0
2025	14,615,502	2,387,923	23,534	22,730	6.875	7.32	6.02	30.83	36.85	0.82	0.37	0.00	0.00	38.04	5,559,470	64.3	44,169.7
2026	14,756,209	2,836,692	28,188	27,442	6.875	7.24	5.83	31.60	37.43	0.83	0.43	0.00	0.00	38.69	5,709,884	66.6	42,026.0
2027	14,898,775	3,278,512	32,762	32,071	6.875	7.17	5.63	32.27	37.90	0.81	0.50	0.00	0.00	39.21	5,841,117	68.9	39,662.2
2028	15,040,538	3,703,461	37,155	36,520	6.875	7.10	5.42	32.76	38.18	0.82	0.55	0.00	0.00	39.55	5,949,201	71.4	37,056.5
2029	15,178,372	4,118,354	41,444	40,858	6.875	7.04	5.22	33.32	38.54	0.81	0.61	0.01	0.01	39.98	6,068,314	74.0	34,108.8
2030	15,314,503	4,521,831	45,612	45,072	6.875	6.98	5.01	33.93	38.94	0.80	0.66	0.01	0.01	40.42	6,190,535	77.0	30,472.6
2031	15,445,537	4,929,124	49,774	49,219	6.875	6.92	4.80	34.55	39.35	0.80	0.72	0.01	0.01	40.89	6,314,919	79.8	27,147.4
2032	15,568,951	5,336,478	53,939	53,353	6.875	6.86	4.58	35.04	39.62	0.80	0.77	0.01	0.01	41.21	6,415,814	82.7	23,489.0
2033	15,678,850	5,741,399	58,080	57,458	6.875	6.80	4.37	35.89	40.26	0.80	0.82	0.01	0.01	41.90	6,569,076	85.8	19,423.9
2034	15,775,101	6,147,011	62,227	61,575	6.875	6.74	4.14	36.80	40.94	0.80	0.88	0.01	0.01	42.64	6,726,202	89.2	14,918.7
2035	15,863,561	6,556,632	66,413	65,735	6.875	6.68	3.91	37.76	41.67	0.80	0.93	0.01	0.01	43.42	6,887,871	92.8	9,939.3
2036	15,948,964	6,971,613	70,653	69,954	6.875	6.61	3.69	38.42	42.43	0.80	0.98	0.01	0.01	44.21	7,049,160	94.6	7,531.6
2037	16,030,763	7,391,013	74,934	74,215	6.875	6.55	3.44	39.18	43.32	0.80	1.04	0.01	0.01	45.01	7,214,117	95.9	5,673.0
2038	16,112,271	7,815,077	79,264	78,528	6.875	6.48	3.21	40.03	44.22	0.80	1.09	0.01	0.01	45.82	7,382,105	97.1	3,990.5
2039	16,192,365	8,244,461	83,645	82,898	6.875	6.41	2.96	40.95	45.13	0.80	1.15	0.01	0.01	46.64	7,552,053	98.2	2,552.6
2040	16,274,789	8,678,480	88,070	87,313	6.875	6.33	2.73	41.92	46.04	0.80	1.20	0.01	0.01	47.47	7,726,058	99.1	1,300.4
2041	16,361,062	9,116,910	92,538	91,778	6.875	6.26	2.48	42.97	47.00	0.80	1.25	0.01	0.01	48.32	7,902,117	99.8	213.7
2042	16,454,842	9,558,530	97,039	96,278	6.875	6.18	2.24	44.07	48.00	0.80	1.31	0.01	0.01	49.17	8,087,186	100.1	(201.9)
2043	16,561,001	10,003,390	101,575	100,821	6.875	6.11	2.01	45.22	49.00	0.80	1.36	0.01	0.01	50.02	8,280,260	100.3	(445.1)
2044	16,685,768	10,449,347	106,122	105,377	6.875	6.04	1.78	46.41	50.00	0.80	1.41	0.01	0.01	50.91	8,481,339	100.5	(661.3)
2045	16,835,085	10,894,603	110,665	109,930	6.875	5.96	1.58	47.64	51.00	0.80	1.46	0.01	0.01	51.84	8,689,413	100.7	(979.7)
2046	17,013,585	11,334,902	115,140	114,463	6.875	5.89	1.40	48.91	52.00	0.80	1.50	0.01	0.01	52.80	8,902,492	101.0	(1,289.1)
2047	17,228,775	11,772,427	119,592	118,966	6.875	5.83	1.24	(1.67)	(0.43)	0.80	1.54	0.01	0.01	53.84	9,120,561	101.0	(1,250.7)
2048	17,483,502	12,204,447	123,969	123,413	6.875	5.77	1.11	(1.59)	(0.48)	0.80	1.57	0.01	0.01	54.91	9,342,620	100.9	(1,199.7)
2049	17,786,206	12,635,535	128,350	127,854	6.875	5.72	1.01	(1.60)	(0.59)	0.80	1.60	0.01	0.01	56.01	9,567,679	100.9	(1,137.8)
2050	18,134,087	13,067,011	132,734	132,301	6.875	5.67	0.93	(1.81)	(0.88)	0.80	1.62	0.01	0.01	57.14	9,795,738	100.8	(1,065.7)
2051	18,520,239	13,500,110	137,146	136,770	6.875	5.63	0.86	(1.79)	(0.93)	0.80	1.64	0.01	0.01	58.30	10,026,797	100.8	(985.5)
2052	18,942,331	13,938,616	141,612	141,303	6.875	5.60	0.81	(1.48)	(0.67)	0.80	1.66	0.01	0.01	59.47	10,261,856	100.5	(600.9)
2053	19,396,152	14,374,377	146,064	145,805	6.875	5.57	0.77	(1.22)	(0.45)	0.80	1.67	0.02	0.02	60.64	10,497,915	100.2	(227.3)
2054	19,873,207	14,801,427	150,434	150,231	6.875	5.54	0.74	(0.90)	(0.16)	0.80	1.68	0.02	0.02	61.81	10,734,974	99.9	115.0
<b>Total</b>														116,114,178			

Note: Assumes an investment return of 20.00% for fiscal year ending 6/30/2021 and 6.875% per year thereafter.

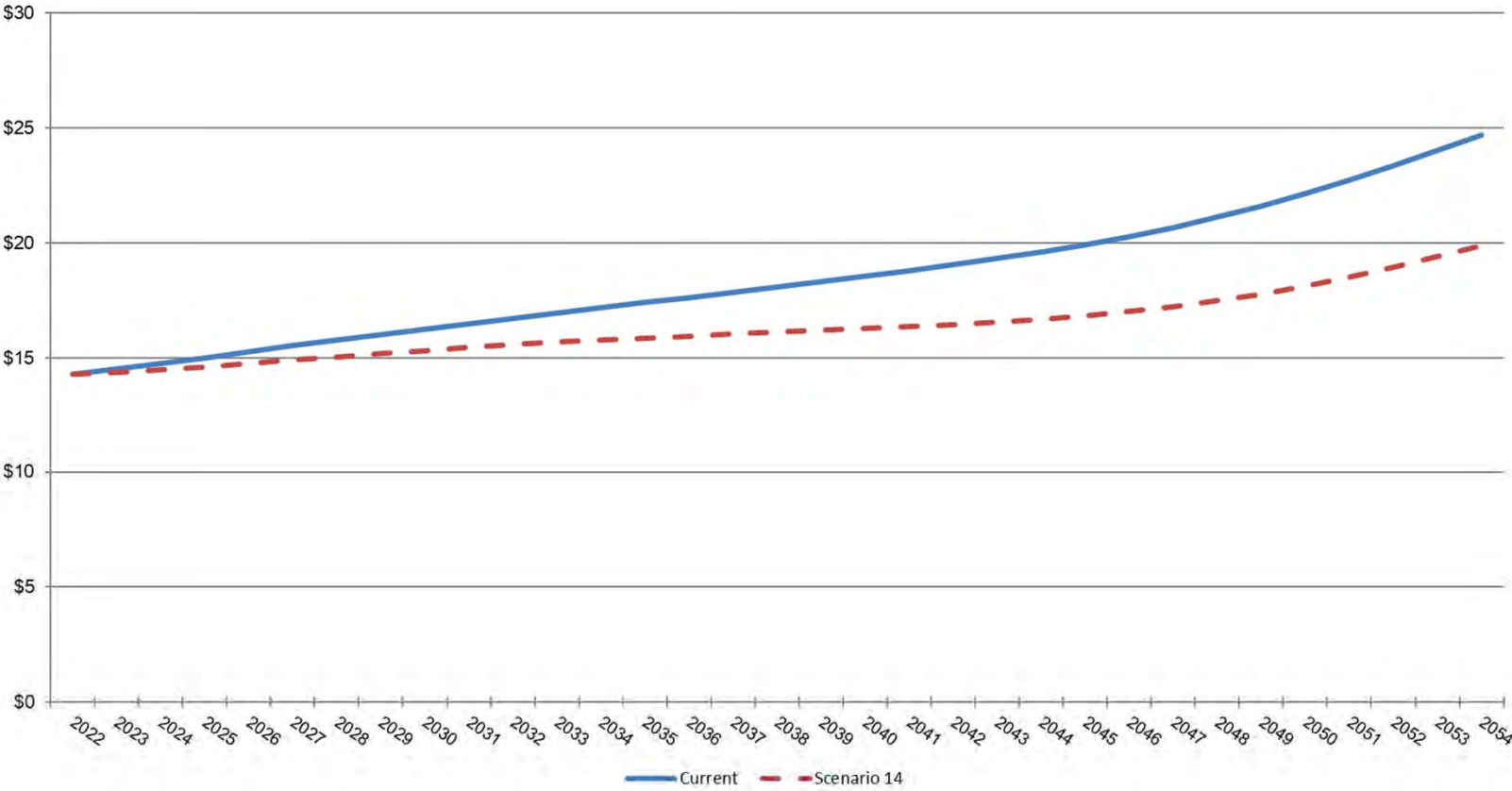
**Scenario 14 Assumptions - Comparison of Projected System Employer Contribution Amounts (Millions)**  
 Revised Demographic, 4.50% Average Salary Increase and 6.875% Interest Rate Assumption (Effective June 30, 2021 Valuation)



**Scenario 14 Assumptions - Comparison of Projected System Employer Contribution Rates**  
 Revised Demographic, 4.50% Average Salary Increase and 6.875% Interest Rate Assumption (Effective June 30, 2021 Valuation)



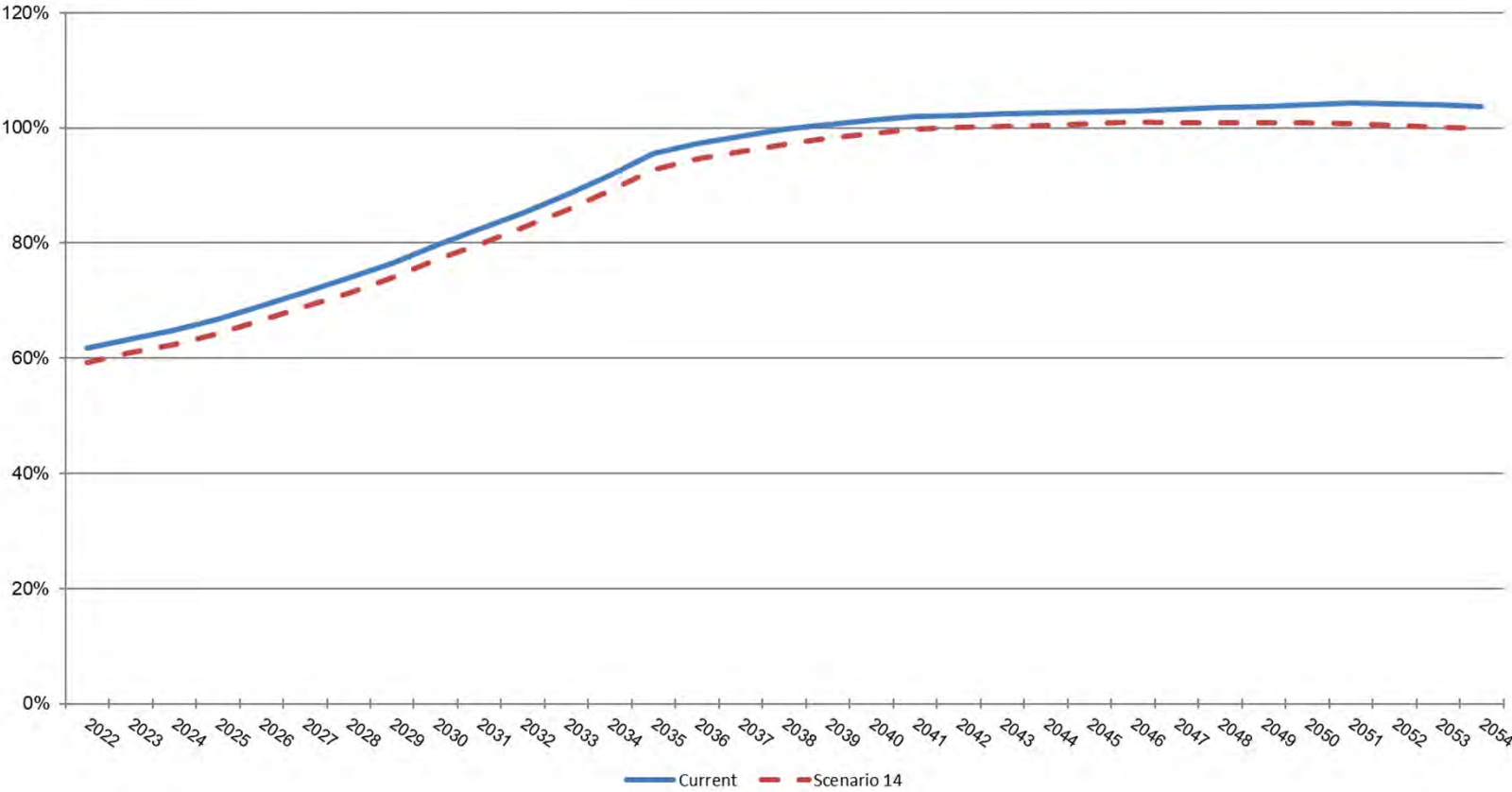
**Scenario 14 Assumptions - Comparison of Projected System Appropriation Payroll (Billions)**  
 Revised Demographic, 4.50% Average Salary Increase and 6.875% Interest Rate Assumption (Effective June 30, 2021 Valuation)



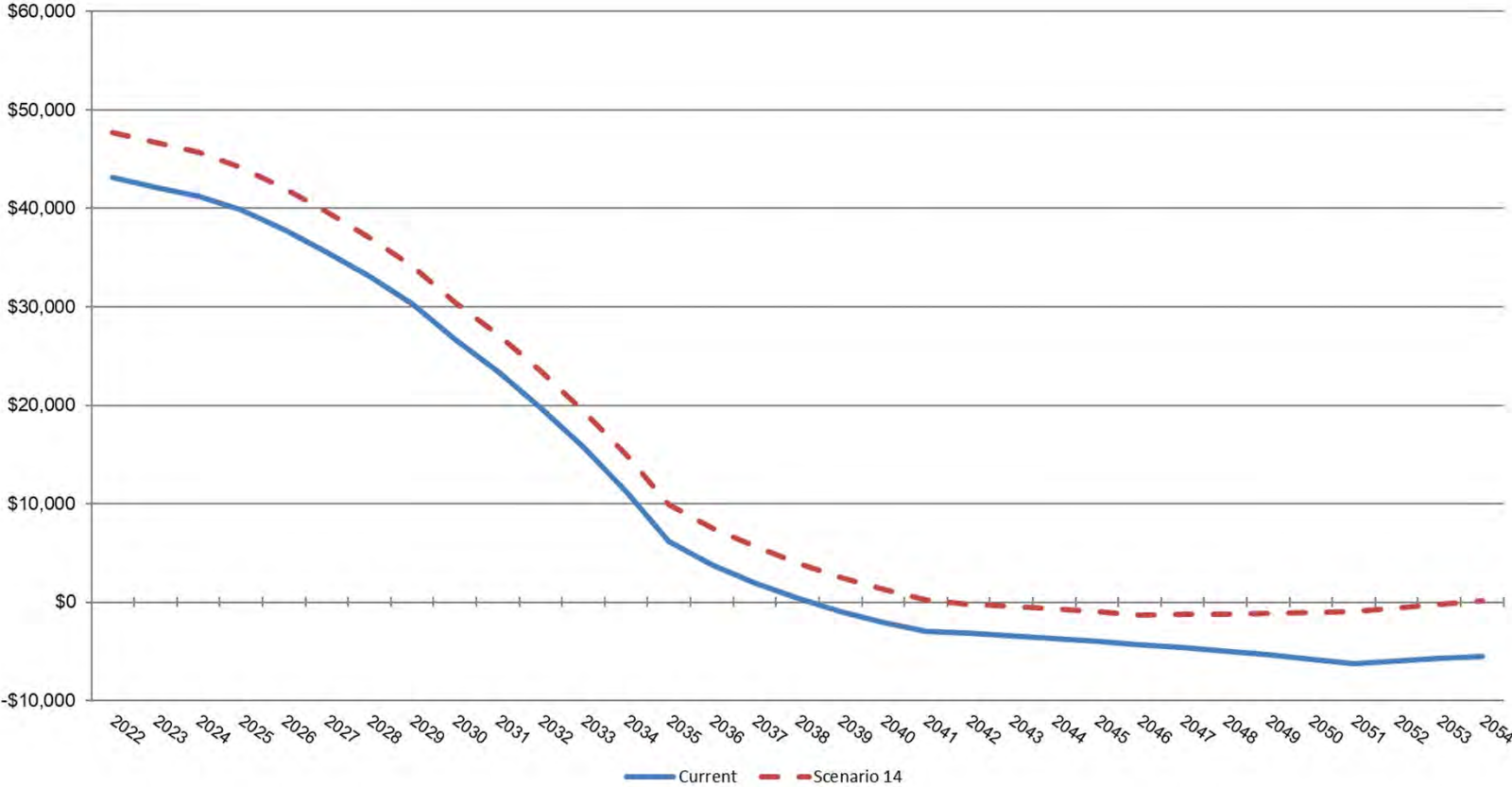
Note: Current assumes a 3.50% annual payroll growth while Scenario 14 assumes a 3.25% annual payroll growth.



**Scenario 14 Assumptions - Comparison of Projected System Funded Ratio (Actuarial Value of Assets)**  
 Revised Demographic, 4.50% Average Salary Increase and 6.875% Interest Rate Assumption (Effective June 30, 2021 Valuation)



**Scenario 14 Assumptions - Comparison of Projected System Unfunded Accrued Liability  
(Actuarial Value of Assets and in Millions)**  
 Revised Demographic, 4.50% Average Salary Increase and 6.875% Interest Rate Assumption (Effective June 30, 2021 Valuation)



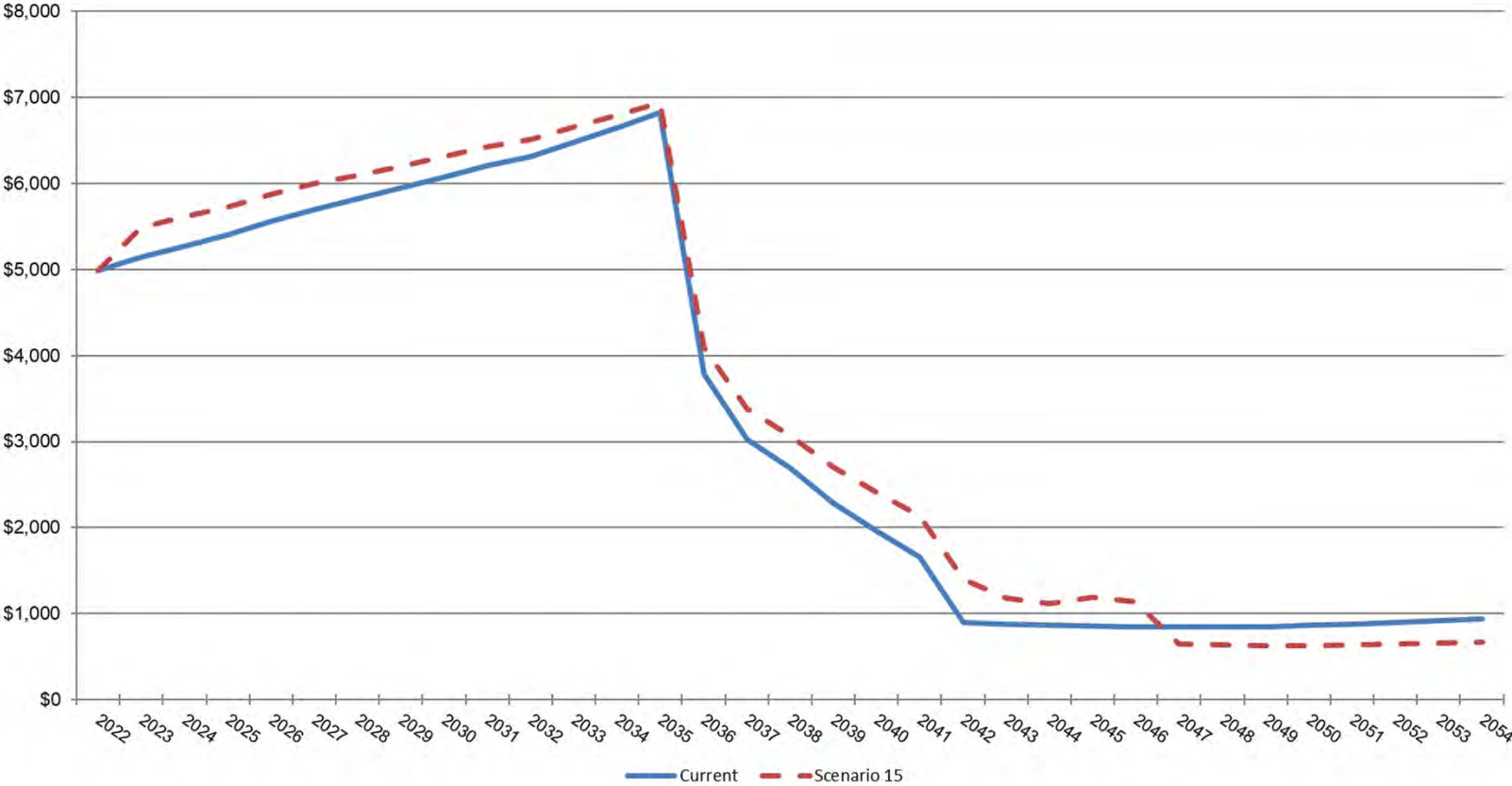
## Scenario 15 Assumptions - Projection of Contribution Rates and Funded Ratios As of June 30, 2020

### Revised Demographic, 4.50% Average Salary Increase and 6.75% Interest Rate Assumption (Effective June 30, 2021 Valuation)

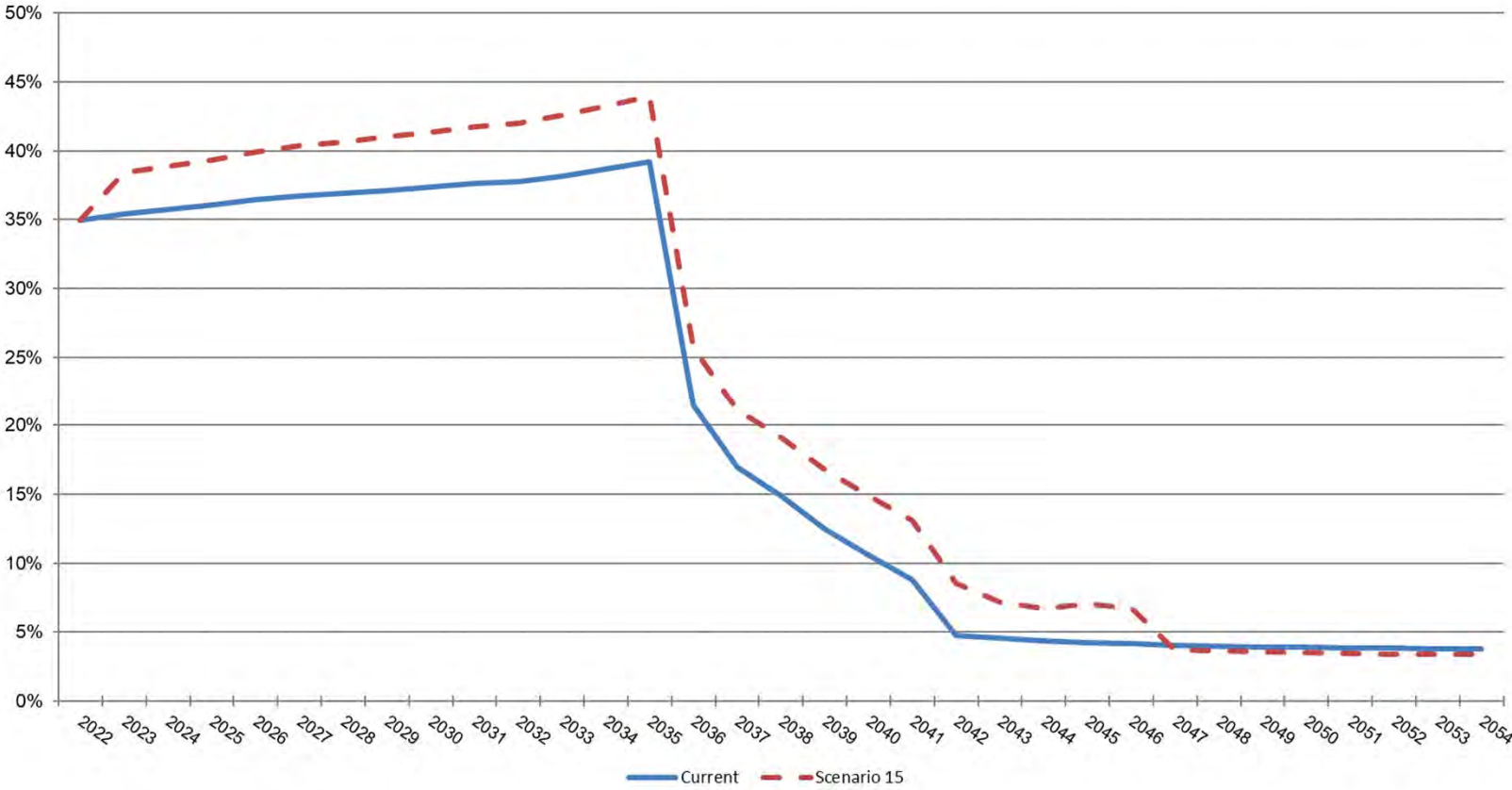
Fiscal Year Ending June 30	Appropriation Payroll (\$Thousands)	DC Payroll (\$Thousands)			Fiscal Year Market Rate of Return	Member Contribution Rate	Employer Normal Cost	Employer Unfunded Liability Rate	Preliminary Employer Pension Rate	Health Care Contribution	Employer DC Contribution Rate			Total Employer Contribution Rate	Projected Total Employer Contribution (\$Thousands)	Funded Ratio	Unfunded Accrued Liability (Based on Actuarial Value of Assets & \$Millions)
		Class TG	Class TH	Class DC Only Participants							Class T-G 2.25% DC	Class T-H 2.00% DC	DC Only Participants 2.00% DC				
2019	\$ 13,775,000					7.57 %	7.59 %	25.01 %	32.60 %	0.83 %			33.43 %		58.1 %	\$ 44,134.2	
2020	13,880,000	\$ 389,350	\$ 179,700	\$ 29,950		7.59	7.49	25.87	33.36	0.84	0.06 %	0.03 %	34.29		59.2	44,034.5	
2021	14,078,000	720,583	332,577	55,429	20.00 %	7.61	7.37	26.14	33.51	0.82	0.12	0.05	34.51	\$ 4,858,318	57.2	49,645.8	
<b>2022</b>	<b>14,289,000</b>	937,344	8,423	7,440	6.750	<b>7.56</b>	<b>7.20</b>	<b>26.79</b>	<b>33.99</b>	<b>0.80</b>	0.15	0.00	0.00	<b>34.94</b>	<b>4,992,577</b>	58.4	49,336.7
2023	14,305,916	1,427,322	13,551	12,629	6.750	7.48	6.80	30.56	37.36	0.82	0.22	0.00	0.00	38.40	5,493,472	60.1	48,199.2
2024	14,429,891	1,914,395	18,618	17,759	6.750	7.39	6.60	31.18	37.78	0.83	0.30	0.00	0.00	38.91	5,614,027	61.7	47,125.4
2025	14,562,451	2,379,255	23,448	22,647	6.750	7.32	6.38	31.77	38.15	0.82	0.37	0.00	0.00	39.34	5,729,051	63.6	45,538.0
2026	14,702,647	2,826,395	28,086	27,343	6.750	7.24	6.19	32.49	38.68	0.83	0.43	0.00	0.00	39.94	5,872,537	66.0	43,319.5
2027	14,844,696	3,266,612	32,643	31,954	6.750	7.17	5.98	33.09	39.07	0.82	0.50	0.00	0.00	40.39	5,996,075	68.4	40,887.1
2028	14,985,944	3,690,018	37,020	36,387	6.750	7.10	5.77	33.53	39.30	0.82	0.55	0.00	0.00	40.67	6,094,111	70.8	38,220.7
2029	15,123,278	4,103,405	41,294	40,709	6.750	7.04	5.55	34.01	39.56	0.82	0.61	0.01	0.01	41.01	6,202,622	73.5	35,221.3
2030	15,258,915	4,505,418	45,446	44,908	6.750	6.98	5.33	34.56	39.89	0.80	0.66	0.01	0.01	41.37	6,312,175	76.5	31,544.1
2031	15,389,474	4,911,233	49,593	49,041	6.750	6.92	5.11	35.10	40.21	0.80	0.72	0.01	0.01	41.75	6,424,673	79.2	28,190.5
2032	15,512,439	5,317,108	53,743	53,159	6.750	6.86	4.89	35.51	40.40	0.80	0.77	0.01	0.01	41.99	6,514,304	82.1	24,517.7
2033	15,621,940	5,720,559	57,869	57,249	6.750	6.80	4.67	36.29	40.96	0.80	0.82	0.01	0.01	42.60	6,654,542	85.2	20,453.5
2034	15,717,841	6,124,698	62,001	61,352	6.750	6.74	4.43	37.12	41.55	0.80	0.88	0.01	0.01	43.25	6,797,811	88.5	15,966.7
2035	15,805,980	6,532,833	66,171	65,497	6.750	6.68	4.19	38.00	42.19	0.80	0.93	0.01	0.01	43.94	6,944,768	92.2	10,962.1
2036	15,891,073	6,946,307	70,396	69,700	6.750	6.61	3.96	39.97	43.00	0.80	0.98	0.01	0.01	44.63	7,098,506	94.0	8,464.4
2037	15,972,576	7,364,185	74,662	73,945	6.750	6.55	3.70	40.96	43.83	0.80	1.04	0.01	0.01	45.38	7,258,253	95.4	6,495.6
2038	16,053,788	7,786,710	78,977	78,243	6.750	6.48	3.45	42.00	44.63	0.80	1.09	0.01	0.01	46.13	7,424,000	96.7	4,689.7
2039	16,133,591	8,214,535	83,342	82,598	6.750	6.41	3.20	43.12	45.39	0.80	1.15	0.01	0.01	46.88	7,594,747	97.8	3,111.3
2040	16,215,715	8,646,979	87,751	86,996	6.750	6.33	2.95	44.30	46.15	0.80	1.20	0.01	0.01	47.63	7,770,494	98.8	1,701.2
2041	16,301,675	9,083,817	92,202	91,445	6.750	6.26	2.69	45.42	46.97	0.80	1.25	0.01	0.01	48.38	7,951,241	99.7	438.0
2042	16,395,115	9,523,835	96,687	95,929	6.750	6.18	2.45	46.54	47.79	0.80	1.31	0.01	0.01	49.13	8,136,988	100.1	(192.9)
2043	16,500,888	9,967,080	101,206	100,456	6.750	6.11	2.20	47.66	48.61	0.80	1.36	0.01	0.01	49.88	8,327,735	100.5	(675.7)
2044	16,625,202	10,411,418	105,737	104,995	6.750	6.04	1.96	48.58	49.42	0.80	1.41	0.01	0.01	50.63	8,523,482	100.8	(1,151.7)
2045	16,773,977	10,855,058	110,264	109,531	6.750	5.96	1.75	49.45	50.17	0.80	1.46	0.01	0.01	51.38	8,724,229	101.3	(1,745.7)
2046	16,951,829	11,293,758	114,722	114,047	6.750	5.89	1.56	50.32	50.92	0.80	1.50	0.01	0.01	52.13	8,929,976	101.8	(2,351.9)
2047	17,166,239	11,729,696	119,158	118,534	6.750	5.83	1.39	(2.11)	(0.72)	0.80	1.54	0.01	0.01	52.88	9,140,723	101.9	(2,525.3)
2048	17,420,041	12,160,148	123,519	122,965	6.750	5.77	1.26	(2.09)	(0.83)	0.80	1.57	0.01	0.01	53.63	9,356,470	102.1	(2,707.3)
2049	17,721,646	12,589,671	127,884	127,390	6.750	5.72	1.15	(2.19)	(1.04)	0.80	1.60	0.01	0.01	54.38	9,577,217	102.2	(2,901.3)
2050	18,068,264	13,019,580	132,252	131,821	6.750	5.67	1.06	(2.49)	(1.43)	0.80	1.62	0.01	0.01	55.13	9,802,964	102.4	(3,109.4)
2051	18,453,015	13,451,107	136,648	136,273	6.750	5.63	1.00	(2.57)	(1.57)	0.80	1.64	0.01	0.01	55.88	10,033,711	102.6	(3,335.3)
2052	18,873,575	13,888,022	141,098	140,790	6.750	5.60	0.94	(2.37)	(1.43)	0.80	1.66	0.01	0.01	56.63	10,264,458	102.4	(3,111.3)
2053	19,325,749	14,322,201	145,533	145,275	6.750	5.57	0.90	(2.24)	(1.34)	0.80	1.67	0.02	0.02	57.38	10,495,205	102.3	(2,887.2)
2054	19,801,072	14,747,701	149,888	149,685	6.750	5.54	0.87	(1.99)	(1.12)	0.80	1.68	0.02	0.02	58.13	10,725,952	102.1	(2,691.8)
<b>Total</b>														<b>119,477,603</b>			

Note: Assumes an investment return of 20.00% for fiscal year ending 6/30/2021 and 6.75% per year thereafter.

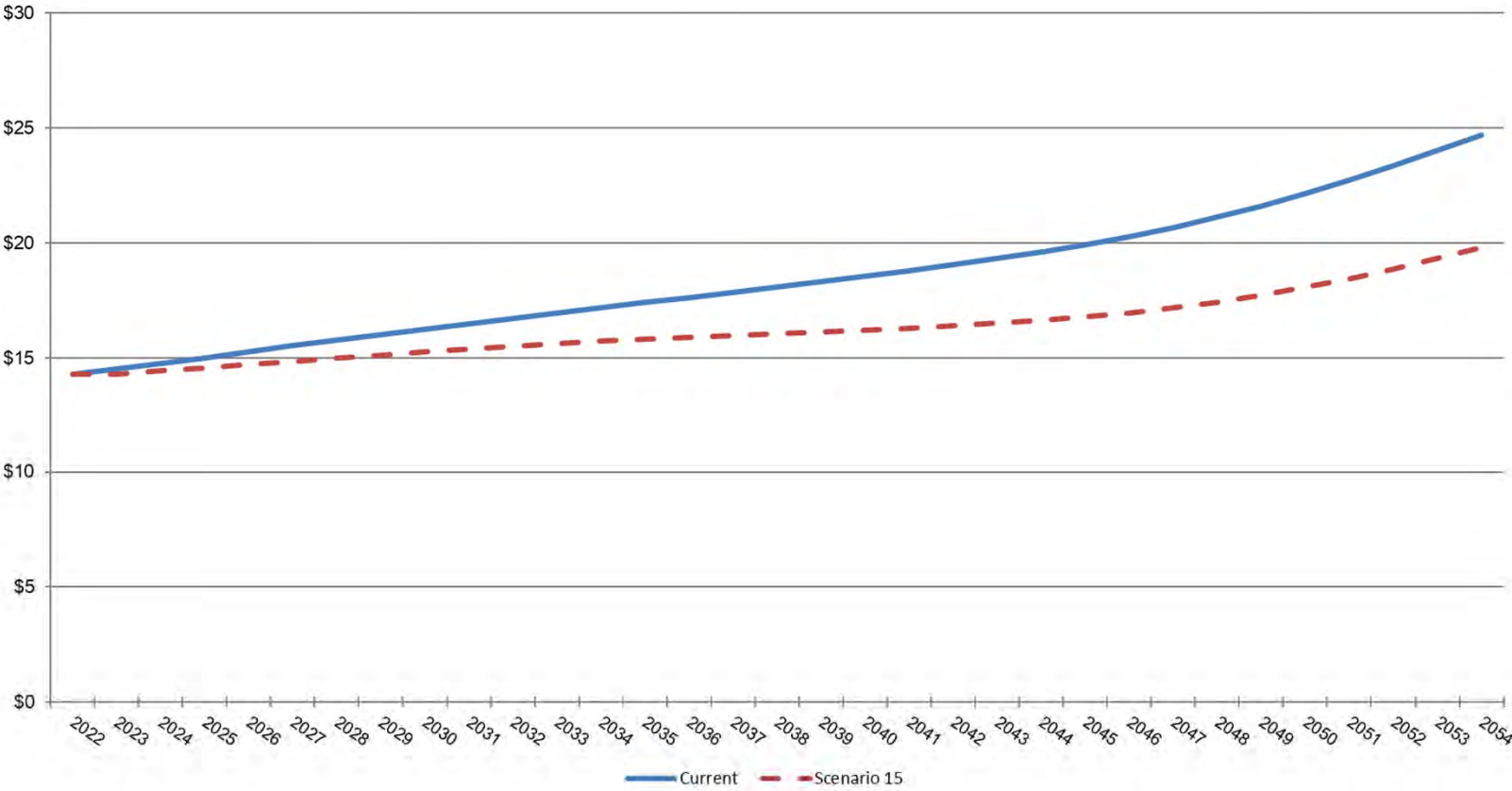
**Scenario 15 Assumptions - Comparison of Projected System Employer Contribution Amounts (Millions)**  
 Revised Demographic, 4.50% Average Salary Increase and 6.75% Interest Rate Assumption (Effective June 30, 2021 Valuation)



**Scenario 15 Assumptions - Comparison of Projected System Employer Contribution Rates**  
 Revised Demographic, 4.50% Average Salary Increase and 6.75% Interest Rate Assumption (Effective June 30, 2021 Valuation)

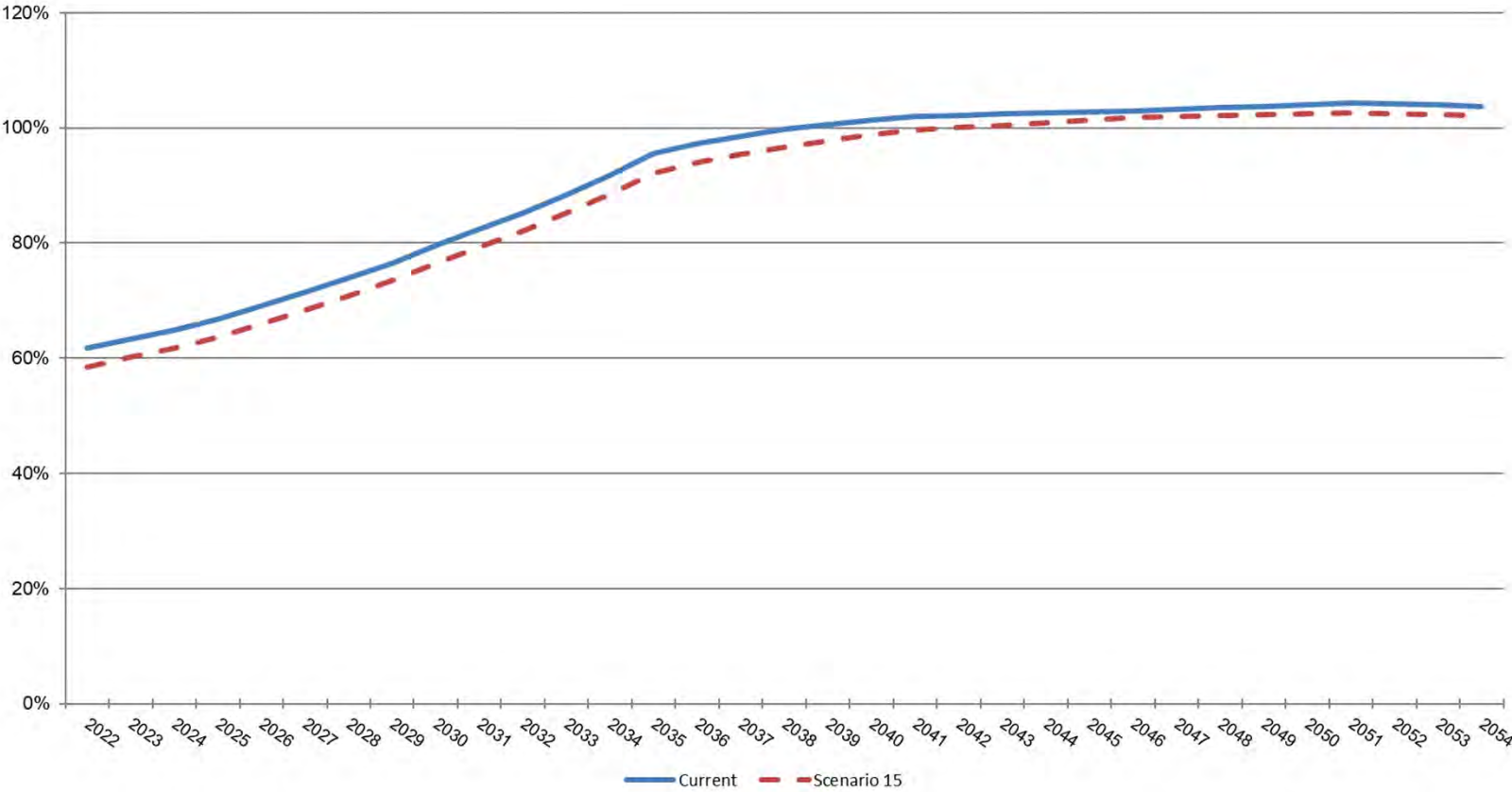


**Scenario 15 Assumptions - Comparison of Projected System Appropriation Payroll (Billions)**  
 Revised Demographic, 4.50% Average Salary Increase and 6.75% Interest Rate Assumption (Effective June 30, 2021 Valuation)



Note: Current assumes a 3.50% annual payroll growth while Scenario 15 assumes a 3.00% annual payroll growth.

**Scenario 15 Assumptions - Comparison of Projected System Funded Ratio (Actuarial Value of Assets)**  
Revised Demographic, 4.50% Average Salary Increase and 6.75% Interest Rate Assumption (Effective June 30, 2021 Valuation)



**Scenario 15 Assumptions - Comparison of Projected System Unfunded Accrued Liability  
(Actuarial Value of Assets and in Millions)**  
 Revised Demographic, 4.50% Average Salary Increase and 6.75% Interest Rate Assumption (Effective June 30, 2021 Valuation)

